



LPD - COMPREHENSIVE PLAN

FILE No. Sevierville (4)

**FLOODS
ON
LITTLE PIGEON
AND
WEST FORK LITTLE PIGEON
RIVERS**

**Vicinity of
SEVIERVILLE
TENNESSEE**

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING



TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

FLOODS ON LITTLE PIGEON
AND
WEST FORK LITTLE PIGEON RIVERS
IN VICINITY OF
SEVIERVILLE TENNESSEE

REPORT No. 0-5805

KNOXVILLE TENNESSEE
FEBRUARY 1958

TENNESSEE VALLEY AUTHORITY
KNOXVILLE, TENNESSEE

April 10, 1958

Mr. Harold V. Miller, Executive Director
Tennessee State Planning Commission
Room C-106, Cordell Hull Building
Nashville 3, Tennessee

Dear Mr. Miller:

In response to the request of the Board of Mayor and Aldermen of the City of Sevierville and the Tennessee State Planning Commission, TVA has prepared the report Floods on Little Pigeon and West Fork Little Pigeon Rivers, vicinity of Sevierville, Tennessee. The purpose of this report is to provide basic information on floods that have occurred or may occur which would be helpful in the state and local program of city planning and development at Sevierville. We are furnishing you copies of the report for distribution to the appropriate state and city agencies and individuals.

Also, copies of the report are being furnished interested federal agencies for their information and use.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



J. Porter Taylor, Director
Division of Navigation and
Local Flood Relations

CONTENTS

Preface	i
I. Past Floods on Little Pigeon River and West Fork Little Pigeon River	
Summary of Flood History	1
Little Pigeon River Valley	3
Settlement	3
Little Pigeon River and Its Valley	4
Developments in the Flood Plain	7
Encroachments on the Flood Plain	8
Bridges across Little Pigeon River and West Fork . . .	9
Dams	11
Flood Situation	11
Flood Records	11
Flood Records at Sevierville Mills	12
Flood Stages and Discharges	14
Flood Occurrences	17
Floods on Little Pigeon and West Fork above Confluence	17
Estimated Discharges for Large Floods	19
French Broad River Floods Affecting Lower Reaches of Little Pigeon River	20
Rate of Rise and Velocities in Large Past Floods at Sevierville	24
Flooded Area in 1957	25
Flood Profiles	25
Valley Cross Sections	26
Flood Descriptions	26
March 1867	27
February 25, 1875	27
August 28, 1893	31
April 1896	32
February 28, 1902	34
November 19, 1906	34
March 19, 1913	35

CONTENTS--(Continued)

March 5, 1917	36
April 2, 1920	37
December 15, 1922	38
June 29, 1928	38
March 23, 1929	39
February 15, 1933	41
February 4, 1936	41
March 24, 26, 27, and April 2, 6, 1936	42
August 5, 1938	43
December 29, 1942	45
January 20, 1947	45
October 31, 1949	46
March 29, 1951	47
April 16, 1956	48
February 1, 1957	50
West Fork Little Pigeon River Floods	57
Acknowledgments	60
 II. Past Floods on Streams in Sevierville Region	
Maximum Known Regional Floods	61
Little Pigeon and West Fork Little Pigeon Rivers vs. Regional Flood Discharges	63
Flood Heights for Various Discharges	64
Regional Flood from French Broad River	66
Acknowledgments	66
 III. Maximum Probable Floods	
Discharges of Maximum Probable Floods	68
Flood Crest Profiles and Overflow Areas	70
Velocities	71
Frequency	71
Possible Larger Floods	71
Acknowledgments	72

TABLES

<u>Table</u>	<u>Page</u>
1 Bridge Data--Vicinity of Sevierville, Tennessee	10
1A Flood Crest Elevations at Sevierville Mills on Little Pigeon River	14
2 Flood Crest Elevation and Discharges above Bankfull Stage--Little Pigeon River at Sevierville, Tennes- see, 1867-1957	15
3 Flood Crest Elevations in Order of Magnitude-- Little Pigeon River at Sevierville, Tennessee, Floods above 12 Feet on Gage	18
3A Estimated Peak Discharges for Large Floods	19
4 Flood Crests on French Broad River at Mouth Little Pigeon River--1867-1917	22
5 Flood Crests on French Broad River at Mouth Little Pigeon River--1918-1942	23
6 Maximum Known Discharges on Streams in General Region of Sevierville, Tennessee	62
7 Relative Flood Heights for Various Discharges-- Little Pigeon River at Sevierville at Stream Gage	64
8 Relative Flood Heights for Various Discharges-- Little Pigeon River above the West Fork, Mile 5.48	65
9 Relative Flood Heights for Various Discharges-- West Fork Little Pigeon River, Mile 0.94	65
10 Selected Maximum Observed Floods	69

PLATES

<u>Plate</u>	<u>Follows Page</u>
1 Little Pigeon River Watershed	4
2 Floods above Bankfull Stage--Little Pigeon River at Sevierville, Tennessee	18
3 Stage Hydrograph--Floods of June 1928 and Jan.-Feb. 1957 on Little Pigeon River at Sevierville, Tennessee	24

PLATES--(Continued)

<u>Plate</u>		<u>Follows Page</u>
4	Maximum Known Flood Discharges--Region of Sevierville, Tennessee	63
5	Flooded Areas--Little Pigeon River below Sevierville, Tennessee	72
6	Flooded Areas--Little Pigeon River above Sevierville, Tennessee	72
7	Flooded Areas--West Fork Little Pigeon River, Vicinity of Sevierville, Tennessee	72
8	Flooded Areas in Sevierville, Tennessee	72
9	High Water Profiles--Little Pigeon River, Vicinity of Sevierville, Tennessee	72
10	High Water Profiles--West Fork Little Pigeon River, Vicinity of Sevierville, Tennessee	72
11	Valley Cross Sections--Little Pigeon River, Vicinity of Sevierville, Tennessee	72
12	Valley Cross Sections--West Fork Little Pigeon River, Vicinity of Sevierville, Tennessee	72

FIGURES

<u>Figure</u>		<u>Page</u>
1	Second Highest Flood in Sevierville	Frontispiece
2	April 16, 1956, Flood	49
3	Flood of January-February 1957	51
4	High Water Marks on West Fork	59

COVER PHOTOS

The two photographs on the cover of this report show scenes in Sevierville during the flood of January-February 1957. The views were taken on the morning of February 1 following the crest which occurred just after midnight January 31. The water had receded about $1\frac{1}{2}$ feet from crest when the photographs were taken. The photographs were taken by and are reproduced by courtesy of the "Knoxville News-Sentinel."

PREFACE

Tennessee Valley Authority
Division of Water Control Planning

PREFACE

This is a report on the flood situation along Little Pigeon River and West Fork Little Pigeon River in the vicinity of Sevierville, Tennessee. It is one of a series of reports that TVA is preparing to aid communities in the Tennessee Valley (1) in the solution of local flood problems which are not eliminated by TVA's reservoir system and (2) in the best utilization of lands subject to overflow. These reports are based on work that TVA has been carrying on since its beginning in connection with its water resources operations throughout the Tennessee Valley. TVA has assembled information on rainfall, runoff, and other technical data bearing on the occurrence and magnitude of floods in localities throughout the region. These data provide the basis for preparation of flood histories of many streams so that this information may be made available to states, communities, and groups which are interested in local flood problems. This report has been prepared at the request of the City of Sevierville through the Tennessee State Planning Commission.

Flood problems at Sevierville are concerned primarily with two streams, Little Pigeon River and West Fork Little Pigeon River, which joins Little Pigeon River at Sevierville. All known large floods of the past have been due to a combination of high water on both streams. However, the possibility exists that even though historically this has not occurred, a significant flood at Sevierville could result from a flood on either one of these streams. Local flooding in Sevierville may occur as a result of intense storms over the watershed of Middle Creek which enters Little Pigeon River 0.4 mile above the mouth of West Fork. There is no record of this ever having been serious in the past.

The highest known flood at Sevierville was that of 1875. This was a little more than three feet higher than the 1957 flood. The 1957 flood is known to have been exceeded by five other floods.

The entire business district and much of the residential district of Sevierville is subject to flood damage. Part or all of this area has been affected by flood on an average of once every two years with at least six floods in the last 26 years which have caused damages and disruption of business. The location of the Little Pigeon River watershed is such that most floods result from general winter and spring storms but these can occur from intense thunderstorm rainfall in the summer season.

Flooding of lands bordering the Little Pigeon River below Sevierville by backwater from large floods on the French Broad River occurred prior to construction of Douglas Dam. Regulation by Douglas Reservoir of floods of the magnitude of any past floods has removed this hazard. However, for larger floods than any that have occurred on the French Broad River, regulation by Douglas Reservoir might be insufficient to prevent backwater flooding.

Localized flooding of streets occurs in Sevierville during intense rainstorms when the capacity of storm sewers may be overtaxed. Such flooding is not treated in this report.

In a number of floods in the past, snow accumulated on the rugged watershed of Little Pigeon River above Sevierville has been a significant factor in increasing flood flows. Snow in any appreciable quantity on the watershed above Sevierville should, therefore, be regarded as a hazard that should alert the town to the possibility of a potential flood should the snow go off in a big rain.

This report is in three parts, (1) a history of past floods on Little Pigeon River and West Fork Little Pigeon River, (2) a description of past floods on streams of similar physical characteristics in the general geographical region of Sevierville, and (3) a discussion of the Maximum Probable Floods that have been estimated as possible of occurrence on Little Pigeon River and West Fork at some future time.

The first section of the report brings together a record of the largest known floods at Sevierville. Profiles are presented showing high water crests for the 1875, 1896, and 1920 floods and for two recent large floods, those of March 29, 1951, and February 1, 1957. Maps show the areas that were inundated in the flood of February 1957.

The second section of this report treats of the largest floods known to have occurred on streams of similar physical characteristics located in the same general geographic region as that of Sevierville and within not more than 75 miles from Sevierville. Floods in this category, which have been experienced on streams having characteristics similar to and located in the same general region as Sevierville, afford an excellent guide, along with the Maximum Probable Flood described in Section III of this report, to the magnitude of the floods that may reasonably be expected to occur on Little Pigeon River and West Fork in the future.

The third section of the report relates to the Maximum Probable Floods that have been developed for Little Pigeon River and West Fork Little Pigeon River. Floods of this magnitude on most streams are considerably larger than any that have been experienced in the past. They are the floods of infrequent occurrence that are considered in planning protective works the failure of which might be disastrous. Such floods are used by TVA in the design of physical features of reservoirs, dams, powerhouses, and local flood protection works. Profiles of these floods are shown in this report and the areas which would be inundated by such floods are shown on maps.

In problems concerned with the control of developments in the flood plain of Little Pigeon River and West Fork in the vicinity of Sevierville, it is important to give appropriate consideration to the possible future occurrence of floods of the magnitude of (1) those that have occurred in the past on Little Pigeon River and West Fork, (2) those that have occurred on streams of similar physical characteristics in the general geographical region of Sevierville, and (3) the Maximum Probable Floods that are estimated might occur. The facts should be weighed with regard to each of these three classes of floods in reaching a decision of how large floods to consider in planning for the use and development of the lands in the flood plains of the Little Pigeon and West Fork in the reaches covered by this report.

The possibility of the occurrence of large floods in the future does not preclude the use of the flood plain lands. Rather, the knowledge that such floods may occur only emphasizes the necessity of giving them proper consideration in planning the use of the flood plain.

The report does not include plans for the solution of flood problems. Rather, it is intended to provide a basis for further study and planning on the part of the town in arriving at solutions to minimize vulnerability to flood damages. This might involve (1) construction of flood protection works, (2) local planning programs to guide developments by controlling the type of use made of the flood plain through zoning and subdivision regulations, or (3) a combination of the two approaches.

The information given in the report should be useful in planning new developments in the flood plain. The maps in the report show the extent of the flooded areas and the profiles show elevations of high water through the reaches of the Little Pigeon River and West Fork covered by this report. Elevations of the ground are shown by contours and by spot elevations on the maps. Cross sections also show ground elevations along the line of each section. From these data the depth of probable flooding by either recurrence of the largest known historic floods or by occurrence of the much larger Maximum Probable Flood at any location may be ascertained. Having this information, floor levels for buildings may be planned either high enough to avoid flood damage or at lower elevations with recognition of the chance of flooding that is being taken. Probably most large developments would have site maps made by private engineering firms. Such maps would show ground elevations in considerably greater detail than do the maps in this report and, in conjunction with the maps and profiles in this report, would provide the necessary basis for the development of any site.

I.

PAST FLOODS

ON

LITTLE PIGEON RIVER

AND

WEST FORK LITTLE PIGEON RIVER



Figure 1.--SECOND HIGHEST FLOOD IN SEVIERVILLE

These views are of the flood of April 2, 1920, which was exceeded in height only by the flood of 1875. The top photo is at the corner of Court Avenue and Main Street. The bottom photo is looking south on Court Avenue from Main Street. The man standing in the water is the late Dr. Z. D. Massey.

(Both photos by courtesy of J. H. Waters.)

Tennessee Valley Authority
Division of Water Control Planning
Hydraulic Data Branch

I.

PAST FLOODS ON LITTLE PIGEON RIVER AND WEST FORK LITTLE PIGEON RIVER

This section of the report covers investigations of floods which have occurred on Little Pigeon River and its tributary West Fork Little Pigeon River in the vicinity of Sevierville, Tennessee. The portion of Little Pigeon River covered by this investigation extends from the mouth in the French Broad River, through Sevierville to River Mile 9.6 at the mouth of East Fork. West Fork Little Pigeon River¹ is covered from its confluence with Little Pigeon River in Sevierville to Mile 9.2.

Records of streamflow have been maintained continuously on Little Pigeon River at Sevierville since 1920. To obtain information on floods prior to that time, engineers of TVA's Hydraulic Data Branch contacted old residents who were able to supply information on such floods. Available newspaper files and historical records were also searched and furnished considerable information on floods on the Little Pigeon and West Fork Rivers. Immediately following the relatively recent high floods of March 29, 1951, and February 1, 1957, investigations were made in the field by engineers of the Hydraulic Data Branch to obtain flood information.

From all of these sources, it has been possible to prepare a history of past floods on Little Pigeon River and its main tributary, West Fork, covering the past century.

SUMMARY OF FLOOD HISTORY

1. The highest known flood on Little Pigeon River at Sevierville on both the Little Pigeon River and on West Fork occurred in March 1875, at which time the flood crest was about 3.3 feet higher than the more recent high flood of February 1, 1957.

1. Sometimes hereinafter referred to only as West Fork.

2. The second highest known flood on the Little Pigeon River below West Fork was on April 1, 1896. This flood was about 1.2 feet lower than the flood of March 1875 and about 2 feet higher than the 1957 flood. This flood was also the second highest known on West Fork but on Little Pigeon River above West Fork, the flood of April 1920 was second highest.

3. The floods of March 1867, April 1920, and June 29, 1928, rank third, fourth, and fifth among experienced floods on the Little Pigeon River below West Fork and were, respectively, 1.5, 2.0, and 2.6 feet lower than the 1875 flood.

4. The highest flood in recent years and the sixth highest known flood was that of February 1, 1957. This flood was 1.3 feet lower than the flood of April 1920 and 0.7 foot lower than the flood of 1928.

5. Large floods of the past have been the result of high floods on both Little Pigeon River above West Fork and on West Fork. Either branch may make the larger discharge contribution to the peak at the confluence of the two streams depending on rainfall distribution and intensity. Either branch may experience a large flood independent of the other but no large flood at Sevierville has resulted from a flood in only one branch.

6. Floods on the Little Pigeon River at Sevierville have in the past occurred most often in the winter months December through March and least often in the summer and fall months, but severe floods can occur at any time.

7. Backwater up the Little Pigeon River from large French Broad River floods was a significant factor in flooding at Sevierville prior to construction of Douglas Dam 5 miles upstream from the mouth of the Little Pigeon River. But under present conditions, regulation of French Broad River floods by Douglas Reservoir would lower the elevation of the highest known past floods on the French Broad River, those of 1867 and 1875, at the mouth of Little Pigeon River by about 14 feet so that recurrence of such floods could not menace Sevierville in the future. However, even with the flood regulation provided by Douglas Reservoir, backwater from floods of considerably greater magnitude than any that have occurred in the past could affect Sevierville but such floods would be of extremely rare occurrence.

8. Overbank flow begins at Sevierville at a stage of about 8.5 feet on the gage. Elsewhere in the reaches covered by this investigation overflow of some bottoms begins at stages of 6 to 8 feet.

9. Snow cover on the mountainous watershed above Sevierville can be a contributing factor to flood flows due to runoff from melting snow when augmented by heavy rainfall as was the case in 1896, 1906, and 1933.

10. The three highway bridges over Little Pigeon River and the seven highway bridges and one railroad bridge over West Fork have clearance elevations which are above the 1957 flood and all but the railroad bridge would pass the highest flood known, that of 1875.

LITTLE PIGEON RIVER VALLEY

Settlement

What is now Sevier County was originally a hunting ground of the Cherokee Indians. Although it appears that few Indians actually lived in what is now Sevier County, the great Indian trails passed through the area. One of these trails followed the Holston River into East Tennessee from Virginia and crossed the French Broad River at War Ford, just below the mouth of Little Pigeon River and about $1\frac{1}{2}$ miles north of the present Boyd's Creek Post Office and continued on into what is now Blount, Monroe, and Bradley Counties. A branch from this trail, starting at about where Boyd's Creek Post Office is now located, moved up the Little Pigeon River to the present site of Sevierville, and on up Middle Creek and through Emerts Cove to cross the Great Smokies and provide access to the Cherokee tribes in western North Carolina and the upper parts of South Carolina and Georgia. Probably the first white men to traverse the territory were traders following these great Indian trails. A Virginia trader, Abraham Wood, sent emissaries over these trails as early as 1672.

By 1784 there were a number of white settlers in the Little Pigeon River basin. These lands were claimed by North Carolina at the time but had been set aside as hunting grounds for the Cherokees. Those who had settled there were for several succeeding years in the position

of squatters on Indian lands. Strife between settlers and Indian warriors continued for several years despite attempts to end this by treaties.

Finally in 1791, the Treaty of the Holston between the United States of America and the Cherokee Nation of Indians was negotiated between the parties. This defined the boundary line between the United States and the Cherokees so that the Little Pigeon River watershed was in United States territory. This extinguished the Indian title to lands already settled by whites and opened the way for further settlement.

Sevier County was formed in 1794 by an act of the Territorial Legislature. The county was formed from a part of Greene County and was named for John Sevier as was the town of Sevierville which was laid out in 1795.

The 1950 United States Census gives the population of Sevier County as 23,375 and of the Town of Sevierville as 1,620. According to the 1954-55 edition of "Directory of Tennessee Industries" there are 10 industries in Sevierville with total employment varying from 950 to 1,150 persons, depending on seasonal demands.

Little Pigeon River and Its Valley

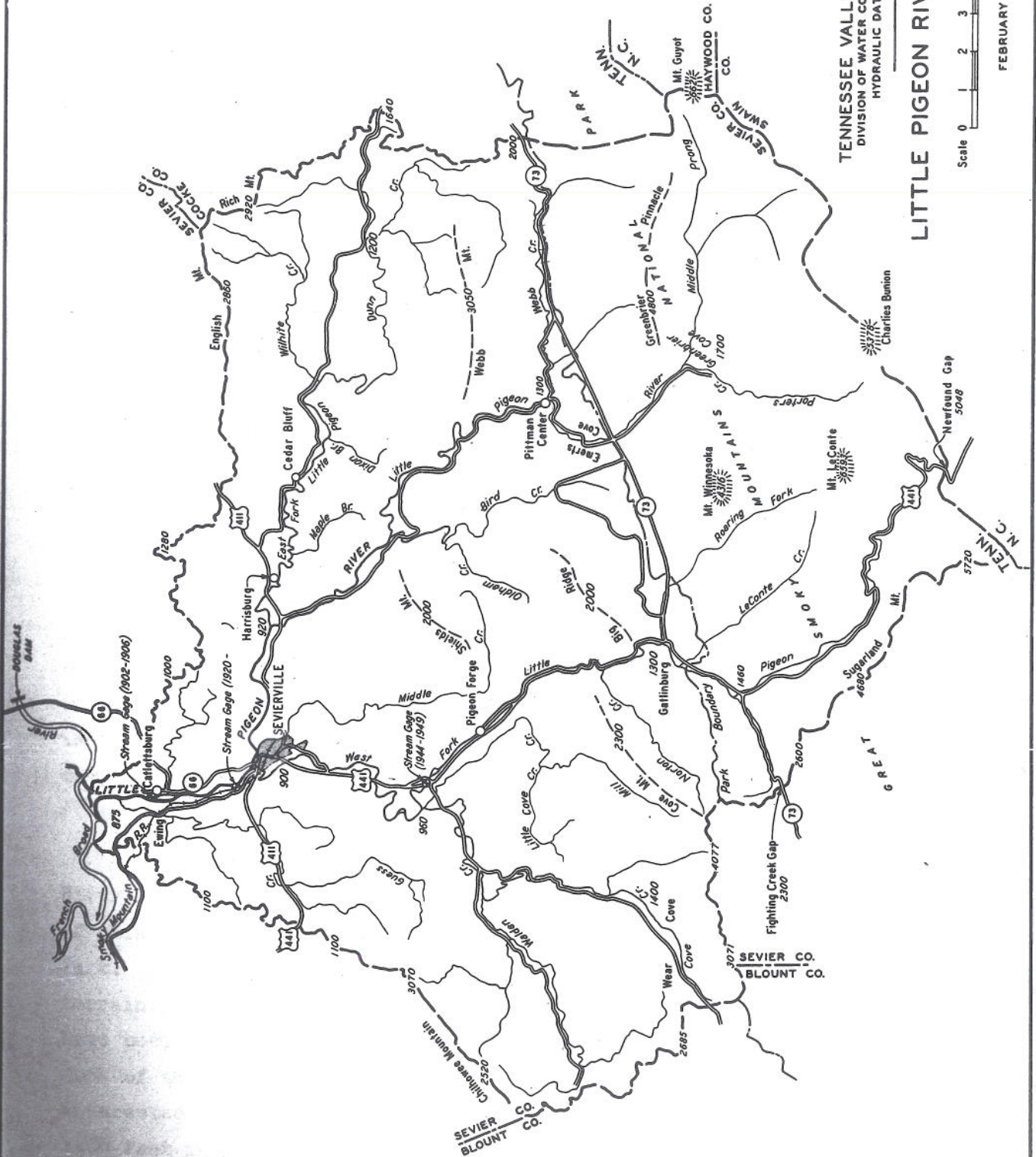
The Little Pigeon River watershed is shown on Plate 1. The basin lies wholly within Sevier County and comprises 381 square miles in drainage area, about two-thirds of the total area of the county. The river system heads in the rugged mountain peaks along the North Carolina-Tennessee State line, with 115 square miles of the drainage area lying within the boundary of the Great Smoky Mountains National Park. Little Pigeon River is formed by the convergence of Porter Creek and Middle Prong in Greenbrier Cove and flows north and west through Pittman Center and Sevierville. The principal tributaries are East Fork Little Pigeon River, entering four miles above Sevierville, and West Fork Little Pigeon which joins the Little Pigeon at Sevierville. East Fork rises against the east divide of the basin and the slopes of Webb Mountain and flows westward through Cedar Bluff and Harrisburg. West Fork, which rises on the western slopes of Mt. Le Conte and at Newfound Gap, drops off steeply to the tourist center of Gatlinburg and flows northward through Pigeon Forge to Sevierville. Walden Creek, largest tributary of West Fork, heads against the low divide at the west

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH

LITTLE PIGEON RIVER WATERSHED

Scale 0 1 2 3 4 5 6 Miles

FEBRUARY 1958



edge of the basin and the south slopes of Chilhowee Mountain. Cove Creek, which drains Wear Cove, is a sizable tributary of Walden Creek. Drainage areas of the principal basin subdivisions are:

Little Pigeon River at mouth	381	square miles
Little Pigeon River at Sevierville stream gage*	353	square miles
Little Pigeon River above West Fork	201	square miles
West Fork at mouth	151	square miles
Walden Creek at mouth	64.6	square miles
East Fork at mouth	70.1	square miles
Little Pigeon River above East Fork	110	square miles
Middle Creek at mouth	15.1	square miles

* Includes West Fork.

The Little Pigeon River watershed lies partly in each of two of the principal physiographic divisions of the Tennessee Valley region, the Blue Ridge province and the Great Valley province. The lower part of the basin, essentially that draining into the Little Pigeon River below Sevierville, is in the shale hills subdivision of the Great Valley province. A strip of land 2 to 3 miles wide, beginning just south of Sevierville and running eastward across the East Fork basin, is in the limestone valley area of the Great Valley province. The remainder of the watershed lies in the Blue Ridge province. The shale hills area is marked by low ridges, with tops reaching 150 to 300 feet above the valley floor and at elevations of 1100 to 1300 feet. Timber has been largely cleared from this land and a somewhat larger acreage is now found in pasture than in cultivated fields. At the west end of the limestone area some streams are found which disappear into sinks or ponds but elsewhere in this area the drainage system is well developed. The land is mostly cleared for cultivation or pastures, but ridge tops and some steep or rocky slopes are still forested in many places.

About two-thirds of the total drainage area of the Little Pigeon River is in the mountain area of the Blue Ridge province and roughly half of this area is within the boundary of the Great Smoky Mountains National Park. An irregular drainage system dissects this rough, hilly and mountainous terrain. Outside the Park, the narrow valleys and the lower mountain slopes have been cleared for agricultural use but most of the land is in forest. Much of this land is owned and operated in fairly large tracts by companies interested in the lumber resources. Valley floors are generally 1000 to 1200 feet in elevation. A number of mountains are found at about 2000 feet

elevation but four of them, Chilhowee, Cove, Webb, and English Mountains, rise to elevations of 3000 to 4000 feet.

In the Great Smoky Mountains National Park, the relief is more rugged, with the area rising to the crest of the Great Smokies along the North Carolina-Tennessee State line. Elevations along the divide range from 5045 feet at Newfound Gap at the head of West Fork, to 6621 feet at Mt. Guyot at the southeastern corner of the basin. Mt. Le Conte, one of the spectacular peaks of the Park, is on a spur ridge running into the basin from the state line. From the peak of Mt. Le Conte, at 6593 feet, land drops off to 1280 feet elevation at Gatlinburg, just five miles to the north.

Sevierville is built on the broad flood plain at the confluence of Little Pigeon River and West Fork Little Pigeon River. Middle Creek, which drains an area of 15.1 square miles between the two larger streams, also enters Little Pigeon River within the limits of Sevierville.

For the 10-mile reach of Little Pigeon River covered by this investigation, the channel slope averages 6.7 feet per mile. For the 20 miles between the Park boundary and Sevierville the stream has an average drop of 25 feet per mile. West Fork has a slope of 9 feet per mile for the 9.2 miles included in the investigation and 22 feet per mile for the 19-mile reach from the Park boundary above Gatlinburg to the mouth at Sevierville.

U. S. Highway 441 traverses the Little Pigeon basin from north to south and is the principal route bringing tourists into the Great Smoky Mountains National Park from the North and Middle West. The highway enters the basin west of Sevierville, crosses West Fork at Sevierville and follows West Fork through Pigeon Forge and Gatlinburg to the Park. The route continues through the Park, crossing into North Carolina at Newfound Gap. Extensive improvement has been under way on this highway since shortly after the end of World War II and when completed will result in a four-lane highway from Knoxville to Gatlinburg. In the Sevierville vicinity this work has resulted in a new fill and bridge across West Fork at the mouth and new alignment and bridges along the full reach of West Fork covered by the investigation. Businesses catering to the tourist trade are now building up rapidly along the new route.

U. S. Highway 411 crosses the lower end of the basin from west to east through Sevierville. From Sevierville west U. S. 411 follows the same highway as U. S. 441. From Sevierville east the route follows Little Pigeon River to East Fork then out of the basin toward Newport. State Highway 66 follows the right bank of Little Pigeon for three miles from Catlettsburg to Sevierville. State Highway 73 crosses the upper part of the basin from west to east through Gatlinburg and Pittman Center.

The Smoky Mountain Railroad, which provides rail service for freight between Sevierville and Knoxville, follows the left bank of Little Pigeon River from Ewing to Sevierville, a distance of three miles, and crosses West Fork in Sevierville.

Developments in the Flood Plain

Nearly all the business district and a large part of the residential district of Sevierville is in the flood plain of the Little Pigeon and West Fork Rivers and subject to flood damage. In the business district between Little Pigeon River and West Fork Little Pigeon River, extensions to existing buildings and new buildings have been added over the years until now they take up most of the available land. In addition to the stores, banks, garages, and other commercial buildings in this area there are two flour and feed mills, Frost Brothers Mill on Little Pigeon River, formerly the Sevierville Mills, and the Temple Milling Company on Bruce Street.

Residences just east of the business district and near the mouth of Middle Creek are subject to flooding. In the last 15 years a residential section has built up north of the business district on the right bank of Little Pigeon River, along Nichols and Jackson Streets. The section is now almost fully occupied by houses with most of these subject to flooding. One of the city's water treatment plants, located in this section, is above the 1957 flood level but might be affected by a larger flood.

The newest residential section to build up is along U. S. Highway 441 south of Sevierville but this is on high ground on the left bank of West Fork, well out of any flood danger. The Church of God Orphanage is on high land on the right bank of West Fork and above flood level.

The Sevierville Grammar School, just east of the business district, was not flooded in 1957. A flood such as that of 1875 would overflow the school grounds but would not be over the classroom floors, the lowest of which is elevation 908.8. The High School, on High Street near Cherry Street, is on relatively high ground and was about 10 feet above the 1957 flood level. The 1875 flood would not flood the school grounds. The lowest floor elevations at the High School are 913.0.

The main highways through Sevierville and the Smoky Mountain Railroad, which passes through the business district on Bruce Street, are all subject to flooding.

The new Cherokee Textile plant is well above flood danger at its location in the Middle Creek valley. A pumping plant on the left bank of Little Pigeon River $1\frac{1}{2}$ miles above Sevierville, which provides water for the Cherokee plant, is on high ground at the side of U. S. Highway 411.

The large quarry and rock crushing plant, operated by Lambert Brothers, has part of its equipment in the flood plain of West Fork near River Mile 2. Another well and treatment plant of the city water supply system is located at the edge of this same bottom. The Blalock concrete block plant, on West Fork just below the abandoned hydro plant at Mile 2.5, would have part of its yard overflowed in a large flood.

Encroachments on the Flood Plain

Some 26 years ago in 1932 Main Street in Sevierville was raised by what appears to be 4 to 6 feet above the original ground from the square west to West Fork. Over the intervening years fill has been added at both sides of the street until a material change in flood plain capacity at this point has resulted. Fill on the north side of Main Street just above Tennessee Highway 66 bridge extends out to the normal water edge. A heavy growth of trees and brush on both banks just below the mouth of West Fork and on a small island there affect flood flows somewhat.

U. S. Highway 411 and 441 now crosses the West Fork flood plain on a long fill near the mouth. Flood flow is carried by the main

bridge over West Fork and a large overflow bridge on the left bank flood plain. A secondary road crosses the bottom just upstream from the overflow bridge. This road was raised a few years ago so that a fill now extends across the bottom which averages four or five feet in height. Openings in the fill consist of ten culvert pipes, one 5 feet in diameter and nine 2 feet in diameter. Hence flow through the overflow bridge is quite small until this road is overtopped. In the 1957 flood, water was over the road to only a shallow depth and flow through the overflow bridge was proportionately small. In higher floods the effect of the secondary road would be less.

U. S. Highway 441 on its new location crosses West Fork on a long fill at River Mile 1.26 and again at Mile 8.95. Bridge capacities at these points were ample to pass the 1957 flood without heading up to any appreciable extent.

Bridges across Little Pigeon River and West Fork

In the portion of Little Pigeon River covered by this investigation there are three highway bridges and a private footbridge. In the reach covered on West Fork Little Pigeon River there are seven highway bridges, one railroad bridge, and one private footbridge. Table 1 lists pertinent elevations at the bridges. All the bridges have clearance elevations which were high enough to pass the 1957 flood. The Smoky Mountain Railroad bridge at Mile 0.18 on West Fork had the least clearance above this flood, 1.6 feet.

The private footbridges serve one or two families each and are both suspension type bridges in poor repair.

Work began in about 1950 on the relocating of U. S. Highway 441 through this reach of West Fork. Traffic has moved over this part of the relocation since 1955. The old location and bridges were all left in place and now serve as connecting or secondary roads.

TABLE 1
BRIDGE DATA
VICINITY OF SEVIERVILLE, TENNESSEE

Mile above Mouth	Identification	Stream Bed Elevation feet	Floor Elevation feet	Flood Crest Jan.-Feb. 1957 feet	Underclearance	
					Eleva- tion feet	Above Jan.-Feb. 1957 Flood feet
<u>Little Pigeon River</u>						
5.18	State Highway 66	884.1	906.2	900.6	904.3	3.7
6.68	Pleasant View Bridge	894.7	913.9	909.1	912.8	3.7
9.84	U. S. Highway 411	919.0	945.5	935.4	943.4	8.0
<u>West Fork Little Pigeon River</u>						
0.04	U. S. Highways 411, 441	885.4	909.1	900.7	905.5	4.8
0.18	Smoky Mountain RR	885.2	905.5	901.0	902.6	1.6
1.27	U. S. Highway 441	889.7	912.8	905.9	909.9	4.0
2.61	County Bridge	897.8	931.2	917.8	929.6	11.8
4.57	U. S. Highway 441	914.7	944.0	930.0	940.5	10.5
6.84	County Bridge	931.4	955.0	950.1	953.8	3.7
8.95	U. S. Highway 441	961.6	980.5	974.2	977.3	3.1
9.20	County Bridge	964.2	983.3	976.4	981.6	5.2

Dams

Within the limits of the streams included in this report are two small dams on Little Pigeon River and one on West Fork. An abandoned concrete mill dam is at the downstream end of the right bank channel around Catlettsburg Island at Mile 2.16 on Little Pigeon River. This is all that remains of the old White Mill which dates back to Civil War days. The concrete dam was built sometime before 1920 by the Sevierville Grain and Feed Company and abandoned when the mill burned in 1952. The effective height of the dam as it now stands is about 7 feet. Low diversion dams at the head of the island and at a cross channel midway of the island divert most of the water into the right channel in low flow periods.

At Mile 5.24 on Little Pigeon River is a low dam which is part of the works which provide water power for Sevierville Mills. The effect of this dam on flood heights during large floods is slight and extends upstream only a short distance.

A concrete overflow dam at Mile 2.5 on West Fork is 11 feet high at the crest of the spillway section. This dam was built in its present form in 1914. In its early years the dam was used to generate power for the Walker Milling Company. After passing through several other ownerships the dam and power plant became part of the Tennessee Public Service power system which was acquired by TVA. The dam was later sold to local interests but it has been idle for many years. In the 1951 and 1957 floods, this dam caused a heading up above the dam of about four feet.

FLOOD SITUATION

Flood Records

The U. S. Geological Survey has maintained records of stream-flow on the Little Pigeon River at Sevierville since November 22, 1920, at a location 0.5 mile downstream from the mouth of West Fork Little Pigeon River. Until June 14, 1928, the observations were made on a staff gage. Since that date a recording gage has been in operation at the site. The U. S. Weather Bureau maintained a staff gage on Little Pigeon River at Catlettsburg, two miles above the mouth and $2\frac{1}{2}$ miles downstream from

the USGS gaging station site, during the period July 15, 1902, to October 31, 1906. Observations were made only from December to June during these years and no significant floods occurred in this period.

Records are available for two short periods on West Fork Little Pigeon River near Pigeon Forge, from observations maintained by the U. S. Geological Survey at the old U. S. Highway 441 bridge at River Mile 9.2. Records of river stages are available for a period in part of 1944 and 1945 and stages and discharges are available from a recording gage operated from February 1946 to July 1949.

Investigations by engineers of the Hydraulic Data Branch were made immediately after their occurrence for the floods of March 29, 1951, and February 1, 1957, to obtain flood heights and history for each of these floods. Local residents who possessed knowledge of past floods were interviewed to obtain data regarding floods that occurred prior to the keeping of gage records on Little Pigeon River.

In addition, research was carried out in available files of newspapers which extend back to February 1895. These papers and the periods for which each is available are:

The Sevierville Star	- February 1895 to May 1897
Montgomery's Vindicator	- July 1897 to 1931, 1933-1934
The Sevier County Republican	- August 1909 to July 1919
The Sevier County Republican and The Sevier County Record	- July 1919 to August 1948, January 1950 to June 1952
The Sevier County News-Record	- October 1951 to date
The Gatlinburg News	- April 1938 to September 1942, 1948-1949
The Gatlinburg Press	- October 1947 to date

In a few cases, Knoxville newspaper files were searched for flood information not found in the Sevierville or Gatlinburg papers. For the most part, the newspaper files were complete but did contain some gaps where floods are known to have occurred as in November 1906.

Flood Records at Sevierville Mills

One of the most valuable sources of information on past floods on many streams is the marks made in old water-powered mills. These marks are ordinarily for quite a number of floods since the mills have

usually been on the streams for a long time. Such an old mill exists in Sevierville on the Little Pigeon River at Mile 5.24 about 300 feet upstream from the bridge on State Highway No. 66 and 500 feet upstream from the confluence with West Fork. The mill has been at this site for over 100 years. The various operators of the mill down through the years have marked the crest stages of a number of the larger rises of the last 50 or 60 years that flooded the lower floor of the mill building.

The original dam was a timber structure that was replaced by the present concrete dam in about 1920. The present building was constructed in about 1900. The present owner and operator of the mill is Mr. Clifford G. Frost who bought it in about 1946 from Mr. J. R. Wade. Mr. Wade, now an insurance agent in Sevierville, owned the mill from 1925 to 1946. Prior to 1925 the owner was a Mr. Bowers, now deceased.

The flood marks in the mill are located in a lower floor room of the building on the farthest downstream of a series of elevators in the room. These marks are pencil lines at the crest level of each flood, together with the date of the crest. The marks represent water level downstream a short distance from the dam. The lower room extends downstream some 35 feet from the dam and the elevator is nearly at the downstream end of the room.

In 1938, engineers of the Hydraulic Data Branch of TVA determined the elevation of all of the marks made up to that time. In 1947 the elevator on which these marks were located was torn out but several of the higher marks were transferred to the next elevator upstream. Subsequent floods have been marked on this second elevator.

Table 1A lists the date and crest elevation of each of the flood marks in Sevierville Mills, together with the elevation of the 1875 and 1951 floods for which marks were available nearby. Also shown are the elevations of the same floods at the stream gaging station, Mile 4.53, and for some of the floods at Court Avenue in downtown Sevierville, Mile 5.35. The difference in elevation between flood crests at the mill and at the other two locations is also shown.

The marks in this old mill have been of inestimable value in establishing the height of the major floods on Little Pigeon River and in furnishing data needed for development of flood profiles.

TABLE 1A
FLOOD CREST ELEVATIONS AT SEVIERVILLE MILLS
ON LITTLE PIGEON RIVER

<u>Date of Crest</u>	<u>Crest Elevation</u>		<u>Fall From Court Ave. To Mill feet</u>	<u>Crest Elevation</u>	<u>Fall From Mill To Gage feet</u>
	<u>At Mill Mile 5.24</u>	<u>At Court Ave. Mile 5.35</u>		<u>At Stream Gage Mile 4.53</u>	
Feb. 25, 1875	902.5(a)	904	1.5	899.4(b)	3.1
(Feb.) 1903	897.4			-	-
Mar. 4, 1917	899.4			895.9(b)	3.5
Apr. 2, 1920	901.5	903.0	1.5	897.7(b)	3.8
Dec. 8, 1924	896.5			893.0	3.5
Jun. 29, 1928	899.8	901.9	2.1	896.8	3.0
Feb. 15, 1933	897.3			894.0	3.3
Mar. 12, 1935	895.5			892.5	3.0
Feb. 4, 1936	897.5			894.3	3.2
Mar. 26, 1936	898.3			894.8	3.5
Mar. 27, 1936	897.8			893.2	4.7
Apr. 6, 1936	897.2			893.9	3.3
Aug. 5, 1938	898.4			894.1	4.3
Jan. 20, 1947	898.9			895.1	3.8
Mar. 29, 1951	899.2(a)			894.7	4.5
Apr. 1956	898.7			894.7	4.0
Jan. 31, 1957	900.6	902.1	1.5	896.2	4.4

(a) From other high water marks; not marked at mill.

(b) Elevation at gaging station estimated from flood profile.

Flood Stages and Discharges

Table 2 lists dates of occurrence, crest elevations, and peak discharges for floods which have exceeded the bankfull stage of 8.5 feet at the Little Pigeon River stream gage at Sevierville. The list is complete for the period since streamflow records were begun in 1920. Floods shown prior to 1920 are those found in the flood history research and doubtless this list is incomplete especially for the lesser floods

TABLE 2
FLOOD CREST ELEVATION AND DISCHARGES ABOVE BANKFULL STAGE
LITTLE PIGEON RIVER AT SEVIERVILLE, TENNESSEE
1867-1957

This table includes all known floods which have exceeded bankfull stage of 8.5 feet at the U. S. Geological Survey stream gaging station on Little Pigeon River at Sevierville 0.5 mile downstream from the confluence with West Fork. The gage was established November 22, 1920. Drainage area at the gaging station is 353 square miles. Zero elevation of the gage is 881.44 feet above mean sea level.

<u>Date of Crest</u>	<u>Gage Heights</u>		<u>Peak Discharge</u>	
	<u>Stage</u> <u>feet</u>	<u>Elevation</u>	<u>Amount</u> <u>cubic feet</u> <u>per second</u>	<u>Per Sq. Mile</u> <u>cubic feet</u> <u>per second</u>
March 7, 1867	16.5	897.9	43,000	122
February 25, 1875	18	899.4	55,000	156
June 20, 1876	(a)			
September 21, 1880	(a)			
August 28, 1893	(b)			
April 1, 1896	16.8	898.2	46,000	130
July 9, 1896	(a)			
March 19, 1899	(a)			
May 23, 1901	(a)			
February 28, 1902	(a)			
November 17, 1906	(c)			
March 14, 1913	14.1	895.5	24,000	68
July 11, 1916	(a)			
July 17, 1916	(a)			
March 5, 1917	14.5	895.9	27,000	76
April 2, 1920	16.0	897.4	37,000	104

River gaging records begun November 22, 1920

February 10, 1921	12.0	893.4	15,700	44
January 21, 1922	9.32	890.8	9,820	28
December 15, 1922	12.5	893.9	18,000	51
December 8, 1924	11.6	893.0	13,900	40
February 23, 1927	10.44	891.9	10,200	29
June 29, 1928	15.4	896.8	32,000	91
March 23, 1929	13.45	894.9	22,200	63
May 7, 1929	9.14	890.6	8,590	24
April 4, 1931	9.50	890.9	9,060	26
January 30, 1932	11.00	892.4	11,600	33
December 28, 1932	10.85	892.3	11,100	31
February 15, 1933	12.54	894.0	18,000	51
March 3, 1934	10.5	891.9	10,400	29
March 12, 1935	11.06	892.5	11,900	34
January 19, 1936	11.82	893.3	14,800	42

TABLE 2--(Continued)

FLOOD CREST ELEVATION AND DISCHARGES ABOVE BANKFULL STAGE

LITTLE PIGEON RIVER AT SEVIERVILLE, TENNESSEE

1867-1957

Date of Crest		Gage Heights		Peak Discharge	
		Stage feet	Elevation	Amount cubic feet per second	Per Sq. Mile cubic feet per second
February	4, 1936	12.84	894.3	19,400	55
March	24, 1936	11.91	893.35	15,300	43
March	26, 1936	13.41	894.8	22,200	63
March	27, 1936	11.71	893.19	14,400	40
April	2, 1936	10.18	891.62	10,100	29
April	6, 1936	12.45	893.9	17,500	50
February	9, 1937	9.25	890.7	8,760	25
August	5, 1938	12.69	894.1	18,900	54
February	15, 1939	9.43	890.9	9,020	26
August	14, 1940	9.17	890.6	8,760	25
December	29, 1942	12.82	894.3	19,400	55
February	18, 1944	10.08	891.5	9,950	28
February	17, 1945	10.57	892.0	10,800	31
January	8, 1946	12.20	893.6	16,600	47
February	10, 1946	11.83	894.3	14,800	42
January	20, 1947	13.67	895.1	23,500	66
February	12, 1948	11.49	892.9	13,400	38
November	28, 1948	10.69	892.1	10,900	31
January	5, 1949	9.86	891.3	9,450	27
June	16, 1949	10.00	891.4	9,650	27
July	13, 1949	9.79	891.2	9,360	26
October	31, 1949	12.58	894.0	17,300	49
February	7, 1950	9.45	890.9	8,730	25
March	13, 1950	10.52	892.0	10,200	29
December	7, 1950	9.89	891.3	9,350	26
March	29, 1951	13.26	894.7	20,400	58
December	21, 1951	9.65	891.1	9,010	25
March	11, 1952	10.43	891.9	10,100	28
February	21, 1953	11.70	893.1	13,300	38
January	21, 1954	11.80	893.2	14,600	41
February	23, 1955	9.80	891.2	9,290	26
April	16, 1956	13.25	894.7	20,400	58
February	1, 1957	14.71	896.2	27,300	77

- (a) Large flood occurred on French Broad River. Little Pigeon River affected by backwater.
- (b) Flood due to cloudburst above Sevierville, according to newspaper account. Stage unknown.
- (c) Large flood on French Broad and Little Pigeon Rivers, according to newspaper accounts. Stage unknown.

of which there is no record or memory. Where crest stages are shown for these pre-record floods they have been estimated from high water marks or other historical information.

Table 3 lists the twenty-one highest known floods in the order of their magnitude. These include all the known floods that reached gage height 12.0 feet or above for which a definite gage height could be estimated.

Flood Occurrences

Plate 2 shows the crest stage and month of occurrence of known floods on the Little Pigeon River at Sevierville. For the 45 floods since the beginning of streamflow records in November 1920, all but seven occurred in the winter months December through April. There were 14 floods in February, 7 each in January and March, and 6 in December. No floods took place in September and just one each occurred in the months of May, July, October, and November. However, floods of thunderstorm origin, such as the flood of June 1928, can occur in any summer month.

Floods on Little Pigeon and West Fork above Confluence

Most large floods of the past have occurred simultaneously on both Little Pigeon River and West Fork above their confluence but the contribution of each branch to the peak discharge below the confluence varies with storm location and intensity so that sometimes West Fork has had a greater discharge than Little Pigeon above the confluence and sometimes the discharge on the latter stream has been the greater.

In the flood of 1875, both branches had nearly equal flood peak discharges, in the flood of 1896, West Fork discharge was nearly double that of Little Pigeon above West Fork, and in 1920 Little Pigeon above West Fork had about 50 percent greater discharge than did West Fork.

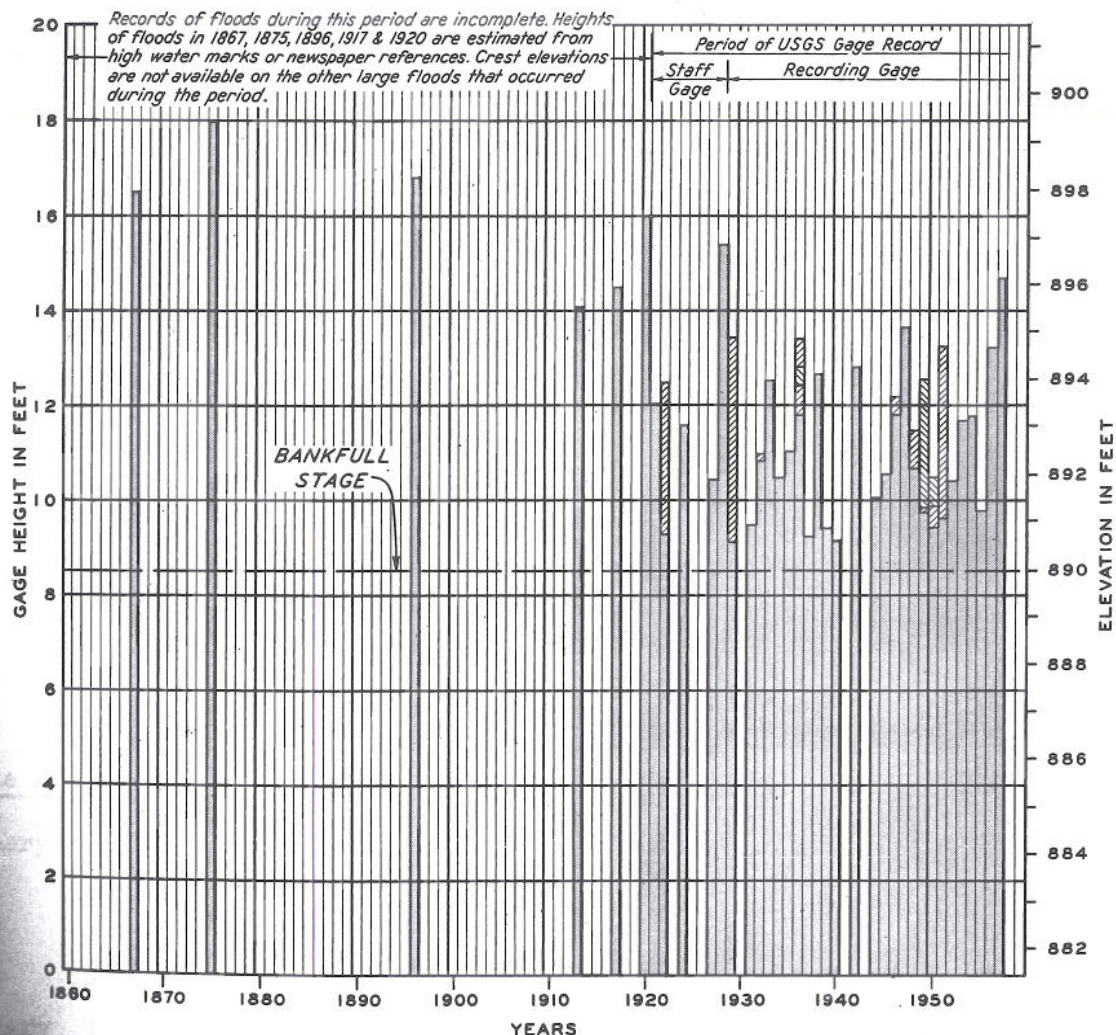
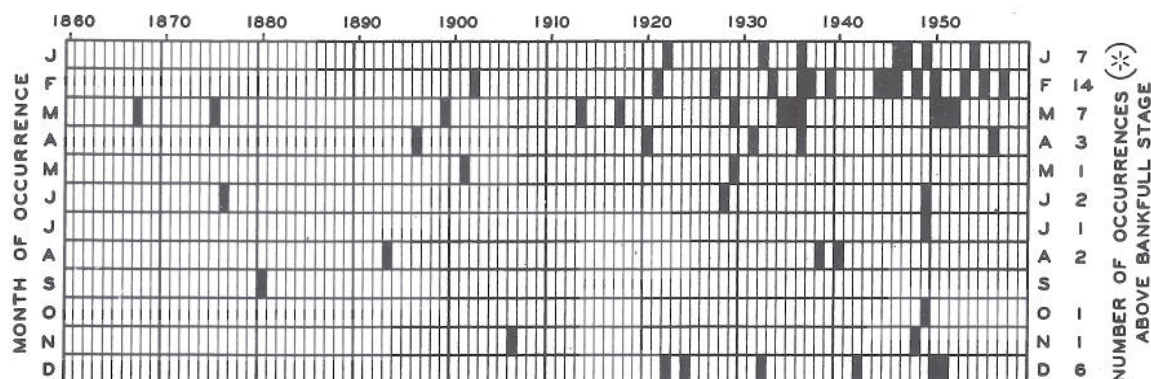
Although during past large floods at Sevierville there has been coincidence of floods both on Little Pigeon River above West Fork and on West Fork, floods can and do occur on each stream when the other is not in flood. For example, the flood of June 1932 was high on West Fork but Little Pigeon above the confluence was not in flood at that time and only a small rise occurred below the confluence of the streams.

TABLE 3

FLOOD CREST ELEVATIONS IN ORDER OF MAGNITUDE
LITTLE PIGEON RIVER AT SEVIERVILLE, TENNESSEE
FLOODS ABOVE 12 FEET ON GAGE

Order No.	Date of Crest		Gage Heights	
			Stage feet	Elevation
1	March	1875	18	899.4
2	April	1, 1896	16.8	898.2
3	March	1867	16.5	897.9
4	April	2, 1920	16.0	897.4
5	June	29, 1928	15.4	896.8
6	February	1, 1957	14.71	896.2
7	March	5, 1917	14.5	895.9
8	January	20, 1947	13.67	895.1
9	March	23, 1929	13.45	894.9
10	March	26, 1936	13.41	894.8
11	March	29, 1951	13.26	894.7
12	April	16, 1956	13.25	894.7
13	February	4, 1936	12.84	894.3
14	December	29, 1942	12.82	894.3
15	August	5, 1938	12.69	894.1
16	October	31, 1949	12.58	894.0
17	February	15, 1933	12.54	894.0
18	December	15, 1922	12.5	893.9
19	April	6, 1936	12.45	893.9
20	January	8, 1946	12.20	893.6
21	February	10, 1921	12.0	893.4

Gage heights and elevations are at the U.S.G.S. stream gage on Little Pigeon River a half mile downstream from the mouth of West Fork.



US Geological Survey staff gage located at Sevierville was established at present site at Mile 4.53 on November 23, 1920. Recording gage installed June 14, 1928. Drainage area=353 square miles. Elevation of zero of gage=881.44 feet (USC & GS 1936 Suppl. Adj.)

(*) Number of occurrences during 37 years of continuous record, Nov. 1920 to Jan. 1958.

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH

**FLOODS ABOVE
BANKFULL STAGE**
LITTLE PIGEON RIVER
AT SEVIERVILLE, TENNESSEE

FEBRUARY 1958

So far as is known no large flood at Sevierville has ever resulted from a flood on one branch without the other also being in substantial flood. Such a possibility does exist but historically it has not occurred.

Estimated Discharges for Large Floods

Peak discharges have been estimated from the best available data for the floods of 1875, 1896, and 1920, the first, second, and third highest of record on the Little Pigeon River and the West Fork at Sevierville. Table 3A gives estimates of discharges for these floods for the Little Pigeon River at the stream gage one-half mile below the confluence with the West Fork and for each of the two streams just above the confluence. Also listed in the table are discharges for the two recent floods of 1951 and 1957 which are based on current-meter measurements of discharge.

TABLE 3A

ESTIMATED PEAK DISCHARGES FOR LARGE FLOODS

In Cubic Feet Per Second

<u>Date of Crest</u>	<u>West Fork At Mouth</u>	<u>Little Pigeon River</u>	
		<u>Above West Fork</u>	<u>At Stream Gage</u>
February 25, 1875	30,000	25,000	55,000*
April 1, 1896	30,000	16,000	46,000*
April 2, 1920	17,000	20,000	37,000*
March 29, 1951	10,500	9,900	20,400
February 1, 1957	13,300	14,000	27,300

* Discharges based on coincidence of peaks from Little Pigeon River and West Fork at confluence. Actual peak discharges probably a small but indeterminate amount less.

During the floods of March 29, 1951, and February 1, 1957, engineers of the U. S. Geological Survey made current-meter discharge measurements a few hours after the crest on the Little Pigeon River and West Fork just above their confluence when the water had fallen only

about 4 inches in 1951 and about 31 inches in 1957. High water profiles of both floods were obtained in the field by Hydraulic Data Branch engineers immediately after each flood. Numerous valley cross sections were also obtained. These data make possible reasonable determinations of peak discharges for the two floods at the locations shown in Table 3A.

A sufficient number of reliable high water marks were obtained in the field on the Little Pigeon River to develop high water profiles for the 1875 and 1920 floods and for a short reach of the 1896 flood on this stream. Similarly, high water marks on the West Fork allowed development of the high water profiles for the floods of 1896 and 1920 on that stream.

From these data, together with cross sections of the flood plain, reasonably accurate estimates of the discharge for these floods on the two streams above the confluence was made. Although no definite high water mark was obtained for the 1875 flood on the West Fork, information handed down to present residents indicates that it was probably a little higher than the 1896 flood.

In Table 3A the discharges determined or estimated for the 1875, 1896, and 1920 floods on the two streams above their confluence have been added together to provide the peak discharge at the stream gage below the confluence. The two streams above the confluence are similar in orographic situation and topography and it is probable that their crests arrived at Sevierville close enough together so that this assumption is reasonable.

French Broad River Floods Affecting Lower Reaches of Little Pigeon River

The reach of Little Pigeon River covered by this report extends about five miles downstream from Sevierville to the mouth of Little Pigeon in the French Broad River. Most of this part of the Little Pigeon is now agricultural land and includes some rather wide gently sloping lands in the flood plain of the river. These lands are subject both to headwater floods and to backwater floods from the French Broad. During high floods in the French Broad River prior to construction of Douglas Dam, the water backed up the Little Pigeon to Sevierville and vicinity to a height depending on the size of the French Broad River flood. Such floods have obviously been important with regard to flooding of the lands along the lower reaches of the Little Pigeon and because the largest of these French Broad floods have even been high enough to extend into Sevierville.

A record of old floods on this portion of the French Broad River was kept by W. S. Trundle, now deceased, in an old family Bible. Mr. Trundle lived near Boyd's Creek, Tennessee, and kept rather complete records on storms, cyclones, floods, and unusual events in his community. The old Trundle home built in 1795 is on the left bank of the French Broad River near River Mile 25 about 2 miles downstream from the mouth of the Little Pigeon in the French Broad. Flood heights were marked by Mr. Trundle on a large sycamore tree at the river near his home but this was cut down many years ago. The references from the old Trundle Bible in Table 4 are to high waters on this reach of the French Broad River which Mr. Trundle called "The most noted high waters in my recollection."

The March 1917 flood was the last recorded in the Trundle Bible. However, since 1917 and before closure of Douglas Dam in 1943, there have been a number of floods that have reached elevations at the mouth of Little Pigeon River higher than the lands bordering the lower reaches of the Little Pigeon. These floods are listed in Table 5.

The lands bordering the lower 2 miles of the Little Pigeon River on the left bank are generally between 870 and 880 in elevation, and it is apparent from the tabulations of floods in Tables 4 and 5 that these lands have been subject to frequent overflow before French Broad River floods were regulated by Douglas Reservoir.

Douglas Dam was closed in February 1943 and since that time the regimen of the French Broad River below the dam has been different than it was before 1943 or than it would have been under natural conditions. The large floods on the French Broad are now regulated by the reservoir so that the situation with regard to backwater floods is greatly improved over what it was in the natural condition before Douglas Dam was built. During the period prior to regulation by Douglas Reservoir, the largest floods that occurred on the French Broad were in March 1867 and in February 1875, both being about the same height. At the mouth of the Little Pigeon River, these floods reached an elevation of 891. Under present conditions with flood waters from the French Broad River regulated by Douglas Reservoir, the height of the 1867 flood would be reduced by about 14 feet at the mouth of the Little Pigeon River. This illustrates the beneficial effect of Douglas Reservoir regulation in so reducing floods at the mouth of the

TABLE 4
FLOOD CRESTS ON FRENCH BROAD RIVER
AT MOUTH LITTLE PIGEON RIVER
1867-1917

From the Trundle Bible		Approximate Elevation at Mouth of Little Pigeon River*
Date of Flood	Mr. Trundle's Comment	
1867 - March 7	This tide was over the island.	891
1875 - Feb. 20	This tide was over the island.	891
1876 - June 20	This tide was over all the first banks.	886
1880 - Sept. 21	Over all first banks, destroyed all bank corn.	876
1896 - April 1	Over all first banks. This tide stopped up the old sluice.	880
1896 - July 9	Over all first bottoms, destroyed all bank corn and washed off thousands of bushels of wheat. This was the most destructive tide of any.	883
1899 - March 19	Over all first banks.	882
1901 - May 23	Over all the flat part of the island, destroyed ten acres of clover for Charlie and Walton	887
1902 - Feb. 28	Highest since 1875, run under Paul's crib, we rode across the island on a skiff, not quite over the island, but over the little meadow.	888
1906 - Nov. 20	Over all first bottoms.	883
1916 - July 11	Over first banks	Lower than 870
1916 - July 17	Highest since 1902. Destroyed nearly all the corn on the island, over my little meadow, lacked six inches being as high as 1902 tide. This was the most destructive tide ever known in this river.	885
1917 - March 4, 5	Over all first banks, lacked 8 feet being as high as 1916 tide. Pigeon River run through Sevierville.	881.5

* Estimated from high water marks and other data.

Little Pigeon River that for any known floods of the past on the French Broad River, flooding in Sevierville from French Broad River backwater would not occur. However, it has been estimated that even with Douglas Reservoir regulation, on rare occasions floods might occur on the French Broad River which would be higher than the 1867 and 1875 floods and which would cause backwater flooding in Sevierville.

TABLE 5
FLOOD CRESTS ON FRENCH BROAD RIVER
AT MOUTH LITTLE PIGEON RIVER
1918-1942

<u>Date of Flood</u>	<u>Approximate Elevation at Mouth of Little Pigeon River*</u>
1918 - January 29	878
1920 - April 2	883
1928 - August 17	877
1935 - March 27	880
1936 - January 20	882
- March 27	878
- April 6	880
1937 - January 3	878
1940 - August 15	879.5
- August 31	881
1942 - December 30	881

* Estimated from high water marks and other data.

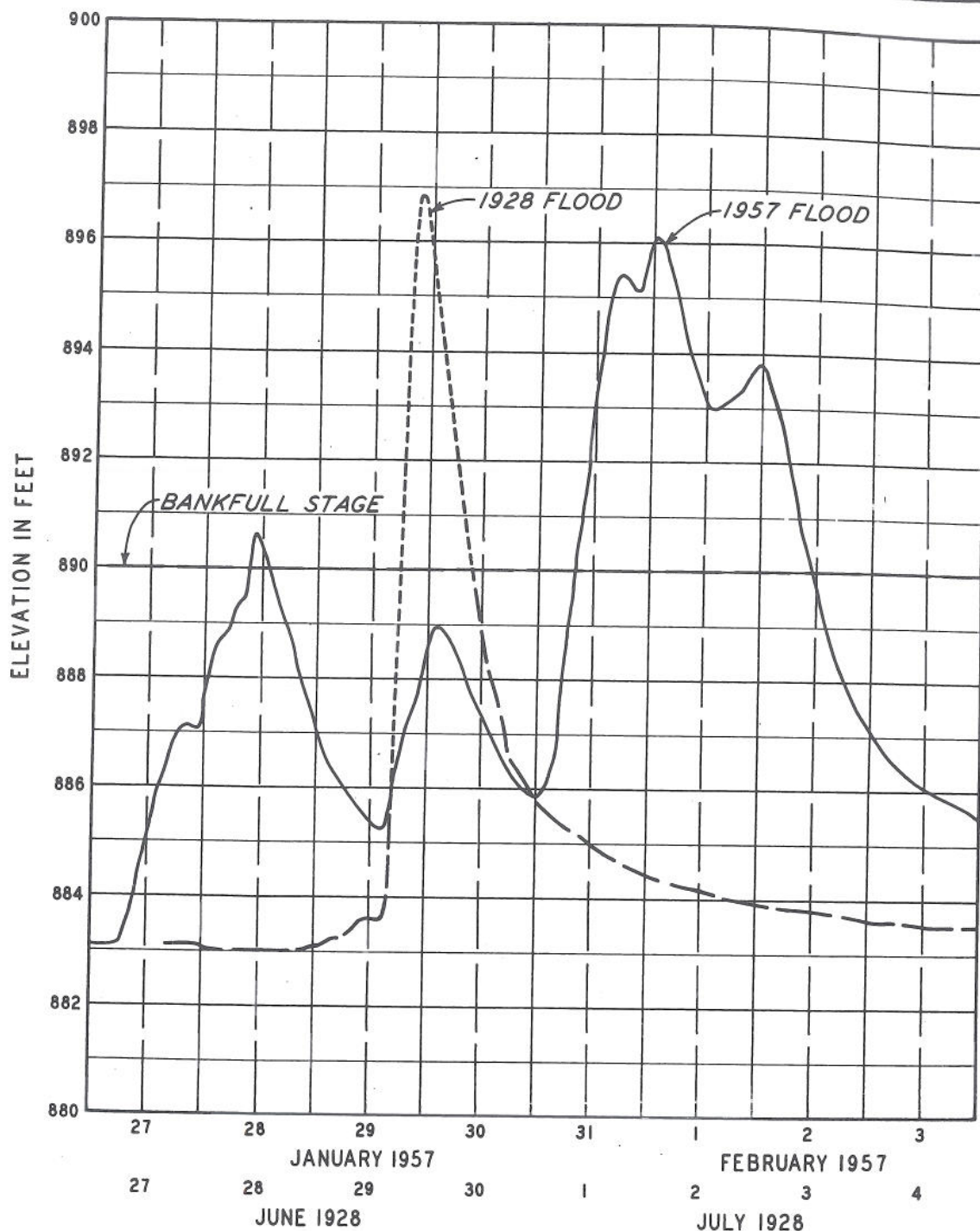
The regulation of French Broad River floods by Douglas Reservoir has resulted in material benefits to the lands downstream from the dam including those along the lower reaches of the Little Pigeon River. A study of the flows in the lower French Broad River below Douglas Dam during the past 15 years since the dam was closed shows that only on one

occasion has there been any overflow of the lands along the French Broad and the Little Pigeon River in the vicinity of the mouth of the latter river. That occasion was the January-February 1957 flood which was a large headwater flood on Little Pigeon River and which is described further in a succeeding portion of this report. The area overflowed during this flood from the headwater flood on Little Pigeon River is shown on Plate 5.

It is noteworthy that had Douglas Reservoir not been in operation during the past 15 years, there would have been 21 overflows of the lands in the vicinity of the mouth of the Little Pigeon River. Had Douglas Reservoir not regulated the flood discharges of the French Broad River during the high water of January-February 1957, the water at the mouth of the Little Pigeon River would have reached practically to the same height as that of the two highest known floods at that location, those of 1867 and 1875. With the French Broad flows controlled by Douglas Reservoir, the flooding that did occur was largely the result of Little Pigeon River headwater. Other occasions when large floods would have resulted without Douglas Reservoir regulation are January 8, 1946, January 20, 1947, January 23, 1954, and April 5, 1957. All of these potential large floods were controlled so that the water level at the mouth of Little Pigeon River was considerably lower than that necessary to cause overbank flooding. It is obvious, then, that Douglas Reservoir regulation confers a very real benefit on the lands bordering the lower reaches of the Little Pigeon River.

Rate of Rise and Velocities in Large Past Floods at Sevierville

The rate of rise of Little Pigeon River during large floods is shown by the hydrographs, Plate 3, for the floods of June 29, 1928, and February 1, 1957. These are the two highest floods at Sevierville since streamflow records began in November 1920. They show the two general types of floods which affect the town. The flood in 1928 was a summer flood. A series of intense thunderstorms occurred throughout the state during the month with the most severe storm over the Little Pigeon basin occurring on June 28-29. At the Sevierville stream gage the river rose more than 12 feet in a six-hour period beginning on the afternoon of June 29, giving the townspeople little time to prepare for the flood.



Elevations are based on recording gage records made by U.S. Geological Survey. Gage located at river mile 4.53. Staff gage established on November 22, 1920 and used until June 13, 1928. On June 14, 1928 a recording gage was installed. Datum of gage 881.44 feet above mean sea level, datum of 1929, supplementary adjustment of 1936.

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH

STAGE HYDROGRAPH
FLOODS OF JUNE 1928 AND JAN.-FEB. 1957
ON LITTLE PIGEON RIVER
AT SEVIERVILLE, TENNESSEE

FEBRUARY 1958

The 1957 flood hydrograph shows a flood resulting from a winter storm, with a series of peaks and less sharp rates of rise, the most rapid being about 7 feet in a 12-hour period.

During floods of the magnitude of those of 1928 and 1957, average velocities in the river channel of Little Pigeon River at Sevierville are about 4 feet per second and maximum velocities are about 8 feet per second. In the flood plain bordering the river, velocities are estimated to have been of the order of $1\frac{1}{2}$ to 3 feet per second. During larger floods, velocities in the channel and in the overflow would obviously be greater.

Flooded Area in 1957

Plates 5, 6, 7, and 8 show the area that was overflowed in the flood of February 1, 1957. The limits of overflow as shown on the maps were obtained on the ground immediately after the flood by engineers of the Hydraulic Data Branch for a large part of the area. For other parts of the reach the limit of overflow has been estimated using flood profile elevations, valley cross sections, and topographic data shown on the maps. The boundaries of the overflow area on Plates 5, 6, and 7 as defined by this latter means are sufficiently accurate for the intended purpose, but the actual limits of the overflow on the ground may vary somewhat from that which is shown on the maps. This is because the contour interval of the maps, which is 20 feet, does not in all cases permit precise plotting of the flooded area boundaries. To define these limits with a higher degree of accuracy would require costly surveys which present purposes do not warrant.

Plate 8 is a large-scale map of the town of Sevierville which shows in more detail than is possible on Plates 5, 6, and 7 the limits of overflow during the January-February 1957 flood. This map also shows numerous spot elevations throughout the city which were obtained during the course of the investigations for this report.

Flood Profiles

Plates 9 and 10 show the high water profiles for the floods of March 29, 1951, and February 1, 1957. High water marks for these floods from which the profiles are developed were obtained by Hydraulic Data

Branch engineers immediately after each flood occurred. Shown also on Plates 9 and 10 are profiles of the stream bed, banks, and low water surface of July 1957. Elevations of dam crests and of floor and under-clearance at bridges are indicated on the profiles. Maximum Probable Flood profiles shown on Plates 9 and 10 are discussed in Section III of this report.

Valley Cross Sections

Plate 11 shows seven valley cross sections of the channel and flood plain area along Little Pigeon River and Plate 12 shows seven sections along West Fork Little Pigeon River. These were selected from the 21 sections on Little Pigeon and the 22 on West Fork which were obtained in the course of the investigations for this report for purposes of engineering studies. Location of all the cross sections is shown on the maps, Plates 6 to 8, and on the profiles, Plates 9 and 10. The cross sections not reproduced are available to anyone who may have need for them.

Each cross section shows the elevation and limits of overflow for the January 1957 flood and also for the Maximum Probable Flood as determined for each stream. Shown on the cross sections on Plate 11 is the elevation of backwater from the Maximum Probable Flood which has been determined for the French Broad River for regulated conditions, where that elevation exceeds the elevation of the Maximum Probable Flood resulting from headwater on the Little Pigeon River. The Maximum Probable Floods are discussed in Section III of this report.

FLOOD DESCRIPTIONS

The following descriptions cover the more important floods that have occurred in the vicinity of Sevierville on Little Pigeon River and West Fork Little Pigeon River for which information is available. The flood descriptions are based on investigations made by TVA Hydraulic Data Branch engineers, on information furnished by local residents, old diaries, and on newspaper accounts of past floods. In the absence of actual records of stream heights and discharges, local residents, diaries, and newspaper accounts are the best available source of information concerning past

floods. Each newspaper account has been carefully reviewed to present only material that appears to give a correct portrayal of the flood being reported.

March 1867

This is one of the great floods of all time on many streams in East Tennessee and on the Tennessee River at Knoxville and Chattanooga was the highest flood ever known. Information regarding this flood on the Little Pigeon River at Sevierville is meager but what is available indicates that this flood is the third highest known on the Little Pigeon at Sevierville.

Rainfall over the Little Pigeon River watershed from March 1-7, 1867, averaged about 11 inches. This heavy rainfall was sufficient to cause a flood at Sevierville which was compared with the great flood of 1875 in a letter from Mr. D. P. Gass in the "Knoxville Chronicle and Weekly Whig" for March 2, 1875, as follows:

At Sevierville, where the bottoms are wide, and where the water spread out at least a mile, the river was 18 inches higher (in 1875) than in 1867, but 6 miles above town, where the bottoms are not so wide, the river was from four to six feet deeper than it was then.

February 25, 1875

This is the highest known flood on Little Pigeon River and West Fork at and in the vicinity of Sevierville including the Little Pigeon below Sevierville down to the mouth in the French Broad River. As a result of very heavy rainfall over the eastern Tennessee River watershed on February 23, 24, and 25, streams all over this territory were in high flood. Rainfall at Knoxville for the storm period totaled 7.8 inches in about 50 hours and it is estimated that from 6 to 10 or more inches of rain fell over the Little Pigeon River watershed in the same time. Cold weather preceded the flood-producing storm and probably the rains fell on frozen ground. This condition would be favorable to a high flood water runoff.

Evidence of the severity of the February 1875 flood on Little Pigeon River was found by TVA Hydraulic Data Branch engineers in 1938 in testimony of two men who then lived near Sevierville.

Mr. Arthur Henderson said that he remembered his father telling him about the flood of 1875 at their home place on Little Pigeon River one mile above Sevierville. He said water was 2 or 3 inches over the floor of the house and that the flood was the highest of which anyone knew or had any record. Mr. R. A. Murphy, who lived near the present U. S. Highway 411 bridge $4\frac{1}{2}$ miles above Sevierville, saw the 1875 flood as a child and stated that this was the largest flood anyone had record or knowledge of at the time. Mr. Murphy said that a flood in 1896, which he also observed at his home, was one to three feet lower than the 1875 flood there.

"The Knoxville Daily Chronicle" for Tuesday, March 2, 1875, portrays the story of the great flood of February 25, 1875 in two accounts published in that paper, one signed by "Sevier" and the other by "D. P. Gass."

THE FRESHET IN SEVIER COUNTY--
LOSS ESTIMATED AT \$200,000--
A STORY OF FEARFUL DESTRUCTION

Sevierville, February 27, 1875. To the Editors of the Chronicle:

It would take a book in which to record everything of interest that has transpired in our county the past week. Pigeon River has been about three feet higher than it was in 1867. There was 20 feet of tidewater and it spread three-fourths of a mile on each side upon an average from Sevierville to the mouth of the river. It swept everything before it--barns, mills, corn cribs, and dwelling houses.

On the West Fork of the river four or five mills were washed away. N. W. Emert lost his saw and grist mill. The bridge at Pigeon Forge was taken, Trotter's mills badly damaged, and their stables, corn, and forage nearly all lost. Thomas Sharp's fine flouring mill, together with his sawmill, barn, and all his forage and corn, also about 500 bushels of wheat, was carried away. His house and furniture were badly damaged. His loss will amount to several thousand dollars. John Carnes lost his kitchen. J. P. Catlett lost his stables and a large amount of forage and several hundred bushels of corn. His farm is badly damaged. Mr. A. Umbarger lost his sawmill.

Sevierville is the picture of distress. The water in the town was from eight to ten feet deep in places and scarcely any place less than three feet. The water was on the floor of

every house in town from 12 to 48 inches deep. The people took shelter in second stories and garrets. At the hour of from twelve to one o'clock in the midst of flashing lightning and torrents of rain, families moved out from their homes in boats and on planks. The river continued to rise rapidly until five o'clock next morning.

The excitement in town was intense; the screams of women and children intermingled with peals of thunder and the roar of maddening waves. It is considered as providential that no lives were lost. The town was surrounded by the waters so that no assistance could be rendered from outside.

Mr. A. T. Blair, two miles below town, lost his sawmill, stables, forage, corn, blacksmith shop, and a good portion of his household furniture. Large quantities of corn and wheat have been damaged in cribs and granaries.

J. S. Ford had about 30 to 40 stacks of hay ruined. The damages to farms cannot be estimated.

While the water was rising so rapidly in Sevierville, prisoners in jail were very much alarmed. They were in the upper story and the water rose above the doors in the lower story so that all means of egress were stopped. The river was still rising rapidly and they could not tell how soon the water would reach them and they could not get out.

The loss in the county is estimated at from \$100,000 to \$200,000. It is impossible to make a correct estimate now.

The water was 14 inches deep in Gass Store, about the same in Murphy's and Emert and Stafford, and about two feet deep in Wynn and Trotters. They all sustained considerable loss.

Signed, Sevier

In addition to what is given in the above letter, we learned that the bridges over Boyd's and Gass' Creeks between here and Sevierville are gone. The mail reached here from Sevierville by a circuitous route through the ridges of Sevier and Knox.

Mr. Murphy, one mile above the mouth of Pigeon River, lost 4,000 bushels of corn which had been shelled and sacked ready for shipment, also a valuable house.

David Reagan, at the head of the West Fork of Pigeon, lost his saw and grist mills.

In Richardson's Cove, Wilson McMahan lost a new flouring and sawmill.

Langston's sawmill and grist mill, seven miles above Sevierville, were carried away. Snapp's mill was badly damaged.

Mr. Dickey's farm near Sevierville, one of the best in the county, is so badly damaged that it is not believed that he will be able to put it in condition to cultivate the coming summer. This, we feel, will be the case with many others, and consequently, the effects of this most disastrous flood will be felt for a long time to come.

A letter received from Mr. D. P. Gass closes with this account of the great freshet:

The water was a foot deep in the highest house in town, except that of William Catlett (it did not quite reach the floor of his house), and from three to four feet in many of the houses. Most of the yard and garden fences were swept away and the streets washed down to the rocks. When the river got back into banks, Sevierville presented more the appearance of a heap of rubbish and drift than of a village.

All the fences along the river from the mouth of Pigeon to the mountains were swept away and a great many cribs, stables, barns, and grist and sawmills, together with all they contained, were borne away by the angry waves of our little river. A large amount of corn, hay, etc., was washed away and much that is left is so badly damaged by the overflow as to be of no value.

When the river had reached the hills on either side of town, left as we were, without even a boat or canoe by which to make our escape, the water being too deep to ford on horses, some of us felt like exclaiming in the language of the poet, "Out on an ocean, all boundless we ride, tossed on the waves of a rough restless tide." And we were not sure that we would ever reach the land beyond the waves of the angry tide.

All our bridges are gone and there is not a mill left but what sustained more or less damage.

The loss to the citizens of Sevierville and the farmers along the river is great, but it is impossible, however, to form any correct estimate of the damage done. No lives were lost that I have heard of.

At Sevierville where the bottoms are wide and where the waters spread out at least a mile, the river was 18 inches higher than in 1867; but six miles above town where the bottoms are not so wide, the river was from four to six feet deeper than it was then.

Signed, D. P. Gass

Another Knoxville newspaper, "The Press and Messenger," in its issue of Wednesday, March 3, 1875, carried the following story reprinted from the same paper's daily of Saturday, February 27.

The first mail from Sevierville arrived last night. The losses of that portion of country in the east and the west forks of the Little Pigeon were large, and whole land was submerged. The following are the particulars of the losses as far as obtainable: Daniel Reagan's mill on West Fork of Pigeon River was washed away. Wesley Emerts' mill on the same stream was washed away. Trotter's Gin and Carding Mill was washed away, greatly damaging his mill on the same stream. The county bridge at Trotter's Ford was also carried off. Henderson's mills were greatly damaged. Thomas Sharp's silo and grist mill was carried off, also his barn and all his grain. His loss is estimated at \$4,000. James P. Catlett's stables and grain were carried off. Wilson McMahon's grist and saw mill on east fork of Pigeon River was washed away. He sustained great loss. The Langston saw and grist mill, seven miles above Sevierville, were washed away. Snaps mills was badly damaged and the dam washed away. The Umbarger mill on the east fork of the Pigeon River was washed away. The bridge depot was also carried off. Steward O. Dickey's farm on the river was greatly damaged and the bottomlands ruined. In Sevierville the water was in every house in town and was two feet higher than in 1867. A. N. Chambers' mill at Sevierville was not damaged and is hard at work grinding. The main road from Sevierville to Knoxville along Pigeon River is completely washed out for four miles. At Blair's, two miles from Sevierville, a sawmill and all the buildings except the dwelling were carried off. W. C. Murphy, at the mouth of Gist Creek four miles from Sevierville, lost 4,000 bushels of corn--most of which was shelled and sacked--and a large amount of hay, also a fine horse. The bridges on the main road to Knoxville from Sevierville over Baird's and Gist Creek were carried off. Well-informed gentlemen estimate the loss to Sevier County in the destruction of bridges, rails, fencing, etc., at two hundred thousand dollars.

August 28, 1893

The only information on this flood is contained in a news account in "The Morristown Gazette" for Wednesday, September 6, 1893:

A CLOUDBURST IN SEVIER COUNTY

The Knoxville Tribune of August 29 gives an account of a cloudburst in the mountains of Sevier County above the town of Sevierville on August 28. The first warning the citizens of Sevierville had of the flood was when it was noticed that the Pigeon River was muddy. By 3 o'clock, the river had risen ten feet, the rise coming all at once as if a large dam had suddenly broken loose. Logs, trees, corn, melons, and parts of houses came down in large quantities, showing that the country further up the river had been terribly torn up. The river was eight feet deep in the streets of Sevierville. No fatalities are reported.

This flood evidently was one of considerable magnitude and illustrates how a flood can occur in Sevierville due to intense heavy rainfall on the mountainous watershed of the Little Pigeon River above Sevierville.

April 1896

High water marks found for this flood along Little Pigeon River above Sevierville indicate that this was a major flood at Sevierville, ranking as the fourth highest known. "The Sevierville Star" in the issue for Friday, April 3, 1896, states:

The Steamer Lucile Borden took advantage of the tide Tuesday morning and steamed up to the point where about 300 Seviervillians from the county bridge viewed the steamer.¹

Sevierville Submerged

On Wednesday morning the people of Sevierville awoke and went about their business as usual, but about 8 o'clock they found that they must engage in a new business. The river was flowing through town the same as through its regular channel. The houses on Main Street were filled with water except the residence of G. W. M. Nichols and W. R. Thomas and the bank building, store of J. R. and M. Yett and the Star Office.

Some went upstairs and others fled to higher ground. The people of the town were kept busy . . . some time removing women and children to their retreats. The liverymen hauled them out until the water was too deep to ford with vehicles. Then a number of canoes were pressed into service and W. H. Thomas brought a barge into play and all were taken to the outskirts of town. At noon the water had reached its height which it maintained for one hour when it began to fall. Near sundown the people who had vamoosed returned to their rendezvous.

W. L. Murphy lost about 900 feet of lumber. P. Maples lost a large quantity of lumber from his yard one mile below town. The footbridge at the McCown and Massey fords were torn loose. R. H. Massey of Henderson Springs lost his blacksmith shop and some other small buildings in his mill yard. Telephone connection is severed some of the posts having been broken by drifts. We cannot discover what amount of damage has been done.

A Potent Reason

Yesterday morning a number of "Infloocencers" were discussing the cause of the recent deluge when "Kernel" (blank) remarked: "The most potent reason I can give there was a vast amount of snow in the mountains which melted suddenly and was followed by an immense amount of rain."

The lumber lost by P. Maples and T. D. W. McMahon is estimated at \$1000 worth.

1. The fact that a steamer did come up the Little Pigeon River to Sevierville at this time was verified by Mr. John A. Seaton in March 1958 in an interview with Hydraulic Data Branch engineer, James W. Beverage.

Sevierville was evidently built in the wrong place and under present "infloence" will keep on being built in the wrong place.

Lowe and Davis are the heaviest losers from the flood of any of the Sevierville business men. Mr. Lowe who runs the store was unable to get to town and no one took the liberty to break open the door. Their stock of sugar, coffee, salt, and field seeds which was on the floor are badly damaged.

The Bowers saw mill is numbered among the "fatal wreck," but they will be able to grind by noon today.

There are more clean floors in town this morning than have been in 40 years, almost every house on Main Street having received a scouring.

Regarding this flood, which was also a large flood on the Tennessee River at Knoxville, "The Knoxville Journal" for Wednesday, April 1, 1896, reports the following:

AN IMMENSE STREAM TENNESSEE RIVER IS ON A BIG BOOM

.

The boatmen are taking full advantage of the tide and the Borden yesterday made landing in the village of Sevier-ville, a point that had not been reached before in a year as the regular landing of the schedule is about three miles from Sevierville. She swept up Pigeon river brushing the telephone wires away like so many spider webs and landed near the new bridges which were crowded with people. She picked up 500 bags of peas while up Pigeon and gathered at other points, five head of cattle, some hogs, chickens and produce and a barge of axe handle timber.

"The Knoxville Journal" for Friday, April 3, 1896, carried this additional story:

HOUSES ADRIFT FOUR PASSED BY ON THE RIVER YESTERDAY

The Tennessee River is still the biggest thing in the state. At eleven oclock yesterday it ceased to rise and stood still for two hours, being at that time thirty-one feet and eight inches above the low water mark. At four oclock it began to slowly recede and at 11 oclock last night had receded only eight inches. The tide is still swift and in many places raging but the drift is not as heavy as it was. There is not as much light stuff though there are more houses

afloat. Four houses passed the city yesterday. It is thought they came from Sevierville where there is more water than there has been in years before.

.

February 28, 1902

This was one of the highest floods experienced on the lower French Broad River and resulted from heavy rainfall over that part of the watershed. In the Trundle Bible this flood on the French Broad is noted as the "highest since 1875." The estimated flood crest elevation on the French Broad River at the mouth of Little Pigeon River was high enough for backwater alone to have inundated the wide plain along the lower reaches of the Little Pigeon. Since rainfall was heavy over the lower French Broad watershed, it is probable that headwater flow in the Little Pigeon was sufficient to have caused a large flood at Sevierville.

November 19, 1906

Unusual weather conditions for this season of the year resulted in large floods on many streams in the eastern part of the Tennessee Valley. Among these was the Little Pigeon River. The November 1906 "Monthly Weather Review" issued by the United States Weather Bureau reports that the heaviest snows of record for November, varying from 4 to 8 inches deep, fell over the region from Virginia to central Tennessee on November 14 and 15. These were followed by rising temperatures on the 16th to 18th which resulted in rapid melting of the snows which together with heavy rainfall on the 18th and 19th produced runoff of flood proportions in many streams. In Sevierville, temperatures on the 14th and 15th varied between a low of 20 degrees and a maximum of 36 degrees with 2.25 inches of snow being recorded. These low temperatures were followed on the 16th, 17th, and 18th by high temperatures respectively of 53 degrees, 71 degrees, and 75 degrees. The runoff from the snow melted by these high temperatures was augmented by the runoff from heavy rain during the 18th and the night hours of the 18th to 19th which totaled 3.48 inches at Sevierville. Cooperative Observer (U. S. Weather

Bureau) Mr. H. O. Eckel recorded on his November report that "River running through Main Street on morning of 19th." This was doubtless a large flood on Little Pigeon River but unfortunately data for establishing the exact height of the water through Sevierville are not available. However, "The Sevier County Republican and The Sevier County Record" for March 17, 1917, of which Mr. Eckel was then editor, rated the flood of March 5, 1917, as the highest since 1896. The 1917 flood reached gage height 14.5 so the 1906 flood, based on the 1917 newspaper statement, would be lower than the 14.5 gage height.

March 19, 1913

This appears to have been a moderate flood but no data are available from which to determine the height reached at Sevierville. "The Sevier County Republican," Wednesday, March 19, 1913, contains the following account of the flood:

PIGEON ON RAMPAGE, HIGHEST WATER KNOWN HERE
IN MANY YEARS, RAILROAD TRACKS UNDER WATER,
THE RAINFALL IN INCHES

Last Friday morning Pigeon River was the highest it has been at this place in many years. The water broke through near the upper end of town and flooded Main Street for a considerable distance. Some of the residents in that section had to move out. Railroad tracks near W. W. Rule's residence on the pike were under water and it lacked only a few inches of getting into Mr. Rule's residence. At the Blair house two miles below Sevierville the railroad tracks were under water so deep that the morning train was stopped at that point and passengers, baggage, and mail were transferred in hacks and buggies. Considerable damage was done to fencing and to plowed fields but no lives were lost.

A continuous rain fell all day Thursday and at five o'clock the government gauge showed 1.22 inches of rainfall. Thursday night the rain fell in torrents and the next morning the gauge showed 1.06 inches more of rainfall. This made a total of 2.28 inches in about thirty-six hours. Three inches of continuous rainfall is the danger limit for Pigeon and would ordinarily send the river down Main Street several feet deep.

Based on the relation of the flood crest to the floor of Mr. Rule's house, the height reached by this flood on the Sevierville gage has been determined to be 14.1 feet.

March 5, 1917

This was a major flood at Sevierville and was only two or three inches lower than the recent January-February 1957 flood. "The Sevier County Republican and The Sevier County Record" for Wednesday, March 17, 1917, gives the following account of this flood:

The almost continuous rainfall of the first four days of March caused Pigeon River to go on the wildest rampage last Sunday known here since April 1, 1896. The water on that date was two or three feet higher than it was on this occasion.

From Thursday, March 1 to Sunday, March 5 the government rain gage measurements totaled exactly six inches of rainfall. From Saturday evening to Sunday at noon the rainfall was 2.80 inches.

By daylight Sunday morning the river was out of its banks and rising rapidly. Telephone reports from up the river on both prongs stated that it was still rising and that the biggest flood in 20 years was on its way to Sevierville. This caused many of the residents on Main Street to move out to higher ground on the south side. They were carried out in wagons, hacks, boats and on horseback. By 9 o'clock East Main Street was flooded and by noon the water had reached the corner of New and Bruce Streets, which was the highest point of the flood. It was about 4 o'clock in the afternoon before the waters began to recede.

So far as we have been able to learn no lives have been lost in the flood. The damage cannot be estimated at this time but it has been considerable. The Sevierville Hardware Company lost between 400 and 500 bags of cement. Practically all the fencing on both prongs of the river in the path of the raging waters was swept away. The big gasoline tank of the Baily-Fain Hardware Company which was buried under the ground was brought up to the surface by the flood, twisting off the pipes and putting it out of commission temporarily. The tracks of the K. S. & E. Railroad from Sevierville to Ewing, a distance of three miles, were so badly washed and twisted out of shape that no trains were able to get into Sevierville either Sunday or Monday. Passengers and mail were transferred by hack line and auto. The residences on the railroad below the depot from W. W. Rule's place down to the railroad crossing stood from one to two feet in water and considerable damage was done to walls, floors, and heavy pieces of furniture that could not very well be elevated. Several homes on the upper end of Main Street suffered like damages.

April 2, 1920

This was the second highest flood known at Sevierville. It was a little more than a foot lower than the 1875 flood and a few inches higher than the 1867 flood. It was 2 feet higher than the January-February 1957 flood of recent memory. Two photographs of this flood are shown in Figure 1, the frontispiece of this report. "The Sevier County Republican and The Sevier County Record" in the issue for Wednesday, April 7, 1920, gives the following graphic account of the flood:

SEVIER SUFFERS FROM FLOOD, RIVER HIGHEST FOR
MANY YEARS, MANY FORCED TO LEAVE HOME, DAMAGE
WILL AMOUNT TO MANY THOUSANDS OF DOLLARS

Good Friday, April 2, brought to Sevierville and Sevier County one of the most disastrous floods known here for many years. All day Thursday the rain fell steadily and measured 1.20 inches at five-thirty in the evening. Thursday night and Friday morning until about daybreak the downpour continued in increasing volume, accompanied with vivid lightning and heavy peals of thunder. This rainfall measured 2.47 inches. This made a total of 3.67 inches of rainfall in less than 24 hours which is much beyond the danger point. Three inches of continuous rainfall is considered dangerous, and under ordinary conditions will put the river into town.

About midnight the water was around most of the homes in the lower end and pretty soon the entire business section was underwater.

Mr. S. G. Randalls is said to be the first to discover that the river was coming in and gave the alarm. Those already surrounded were aided to places of safety by those who lived on higher sections of the town. Wagons, buggies, autos, and horses were pressed into service and many waded out. No lives were lost, which seems almost miraculous.

By three o'clock the crest of the tide had reached Sevierville, and a little later the flood began to recede and everybody breathed a sigh of relief. The damage done will be hard to estimate but it will amount to many thousands of dollars. Fences, small buildings, lumber, livestock, bridges, etc., are scattered in endless profusion along the path of the flood. W. W. Ride, H. V. Lowe, John Roden, Addie Jenkins, and Mr. Blanchard, living along the railroad track below Sevierville perhaps suffered the worst damage to their household goods--carpets, beds, clothing, furniture, etc., were covered up with water and mud and almost entirely ruined. The water was several feet deep in these houses.

A. H. Lowe lost some fine hogs. S. L. Atchley lost a flock of valuable sheep, and nearly everybody lost from one to fifty chickens.

The big iron bridge at Pigeon Forge was undermined by the current and swept away in the flood. There is scarcely any fencing left in the track of the rushing waters; and where land had been plowed for spring crops, much of it has been swept away. The railroad tracks along the bottoms were washed around in several places and the dirt washed from between left the rotten crossties hanging to the rails. The train did not get farther than Ewing Friday or Saturday.

This week the river is almost back in banks again and things are going along pretty much as usual.

The same newspaper for Wednesday, April 14, 1920, contains this additional statement:

The recent flood tested pretty thoroughly the bridges in the county. Concrete bridges are reported to have stood the test in good shape and thus attest the wisdom of the pike commission in having them properly placed and properly constructed.

December 15, 1922

"The Sevier County Republican and The Sevier County Record" for December 20, 1922, gives the following account of this moderate flood:

PIGEON ON A RAMPAGE

The heavy rain last Thursday night sent Pigeon River on a rampage the following day, doing lots of damage. The railroad bridge was washed out at Ewing, preventing trains from reaching Sevierville for two or three days. As a result, Sevierville had no mail, freight, or express. Passengers were transferred around the washout.

Walden's Creek was said to be the highest known in years. All the forms and timbers where the contractors are putting in concrete bridges were washed out, causing considerable loss. Traffic has about been restored to normal this week.

June 29, 1928

This is the fifth highest known flood at Sevierville. The flood was about 8 inches higher than the flood of January-February 1957. The 1928 flood differs from other large floods at Sevierville in that it resulted from severe local thunderstorms, not from a general winter type

storm. The only two rainfall stations then in the watershed, at Sevierville and Gatlinburg, had totals for the storm of 3.25 and 4.0 inches, respectively, but rainfall over the rugged watershed above Sevierville was probably considerably higher.

The following account of the flood is from the July 4, 1928, issue of "The Sevier County Republican and The Sevier County Record":

SEVIERVILLE FLOODED, PIGEON GOES ON RAMPAGE
FRIDAY NIGHT, BUSINESS HOUSES FLOODED, MUCH
CROP DAMAGE IN COUNTY

Following the heavy rainfall last Friday Pigeon River came in during the night to pay Sevierville an unwelcome visit. Between ten and eleven o'clock Friday night the two prongs of the river and Middle Creek came together at Sevierville and overflowed Main Street, Court Avenue, and Park Road as far south as the Seaton Grocery Company. Most of the business houses on Court Avenue were flooded, the water standing several inches deep in them. Nearly all the merchants were on the lookout and went in and put up higher such of their goods that were on the floor and would be damaged if they got wet. Lawson Drug Company, Purity Cafe, J. T. Atchley and Company, Murphy's, Sevierville Hardware Company, Love Store Company, McConkley Drug Company, The Five and Ten Cent Store, Kay Rawlings and Company, C. L. Thurman Motor Company, Service Garage, Sevier County Bank, and several residences on Main Street were flooded several inches deep.

Out in the country districts along the water courses the damage to growing crops, fences, orchards, and buildings was something fierce and will mount up into the thousands. In the Middle Creek section a terrific wind and hail storm swept through a strip of country, doing lots of damage. Hail stones as large as a hen egg were reported; and corn, tobacco, hay, wheat, vegetables, and orchards were reported to be about ruined.

Many buildings were unroofed, others blown down and trees uprooted.

During Thursday night and up to Friday evening at five-thirty o'clock 3.05 inches of rain fell. The river gage showed a tide of 15.40 feet. This is the highest the river has been since 1920 when it got into Sevierville. During the month of June 9.24 inches of rain fell. This is much above normal.

March 23, 1929

This was one of the worst flood periods ever experienced in the Cumberland Mountains and surrounding areas. Over the watershed of the Little Pigeon River, however, the storm was not so severe and resulted in only a moderate flood on that stream.

"The Sevier County Republican" for Wednesday, March 27, 1929, reports this flood as follows:

TERRIBLE FLOODS IN EAST TENNESSEE SATURDAY

Sevier Damage Slight - Many Deaths Reported
In East Tennessee Towns - List Will Probably
Reach 30 and Possibly More

The terrific downpour of rain last Friday night and Saturday morning brought old Pigeon up to a height of 13.55 feet according to the U. S. river gauge. The rain gauge showed the rainfall to be 2.07 inches from Friday night to about 10 o'clock Saturday morning. The upper half of Main Street was under several feet of water and some of the residences were vacated. A small section of Court Avenue was also flooded but not sufficient to stop traffic. The damage in Sevierville and Sevier County was very small. Some freshly planted fields were covered with water, considerable fencing and lumber and crossties were swept away.

"Montgomery's Vindicator" for Wednesday, March 27, 1929, also describes this flood and contains a picture of East Main Street during the high water Saturday afternoon. The "Vindicator's" story is as follows:

HIGH WATERS IN SEVIERVILLE

No Property Damage Done

The East and West Prongs of Pigeon River and Middle Creek, on three sides of Sevierville, rose rapidly Saturday morning as a result of the downpour of rain Friday night, and soon left their banks. The East Prong and Middle Creek spread out and soon flooded a part of Main Street and ran up Park Road to the Big Ditch where it spread over the lots to Court Avenue and the water ran into the floor of the Sevierville Hardware Company. The owners of the store anticipated the flooding of their store and had moved their wares to safety. The floor flooded is concrete and the only damage was mud deposited and which was swept out as the waters receded.

A few homes along Middle Creek and the East Prong were surrounded by water and some of the families vacated as a matter of precaution.

The contour of the land around Sevierville is such that the waters spread slowly and gradually and there is never much danger of the washing away of buildings or of a loss of life. The rivers here have been several feet higher in recent years and the damage done in Saturday's high waters was to adjacent farm lands in washing away freshly plowed soil and the depositing of silt on the flooded lots in a part of Sevierville.

Wednesday, February 5, 1936

RUTH'S LETTER TO HELEN

Dear Helen:

The old saying, "More rain, more rest," might be true but if we were to say, "More snow, more rest," it would not be true, especially if it were a deep snow like we have had the past week.

February 12

(Editorial Column)

The snow that fell last week was the deepest that the oldest inhabitants remember for several years. The average depth was about 12 inches. The frigid blasts that followed the snow sent the mercury to four degrees below zero and caused much suffering.

March 24, 26, 27, and April 2, 6, 1936

Again in 1936, heavy rainfall in the latter part of March and early April resulted in a series of 5 flood crests with the Little Pigeon rising from 2 to 5 feet above flood stage. These crests and the date of their occurrence are as follows:

<u>Date</u>	<u>Gage Height</u>
March 24	11.91
26	13.41
27	11.71
April 2	10.18
6	12.45

Concerning the prolonged period of storms and high water, "The Sevier County Republican and The Sevier County Record" of Wednesday, April 1, 1936, reports as follows:

ROUTE 5 NEWS

We have had plenty of water during the past few days. Traffic was blocked by flood waters on the highway near the residence of L. A. Latham for some time Thursday morning. White School Building was reported to have been damaged by the water rising into the classrooms recently. Several bridges were washed away during the heavy rains.

Page 2

The terrible floods of recent weeks and the Hauptmann case have crowded the war news from Europe off the front page.

Page 5

FARM TALKS BY D. B. HENDRICKS, COUNTY AGENT

We estimated that the heavy rains of last week have damaged Sevier County at least a quarter of a million dollars, and the biggest part of this loss has come to the farmers. A great deal of this damage could have been prevented if all the steep and sloping land had been in good sod.

"The Sevier County Republican" for Wednesday, April 8, 1936, describes a storm that probably caused the April 6 flood crest at Sevierville.

SEVERE STORM HITS WALDEN'S CREEK

A storm of cyclonic proportions struck Walden's Creek about 1:30 o'clock Monday morning doing damage that will probably mount into the thousands.

The path of the storm was about a mile and a half wide. It consisted of rain, hail, and wind. Barns were blown down, livestock killed and crippled, and trees uprooted.

August 5, 1938

Although this flood was only a moderate one on the Little Pigeon River at Sevierville, the extremely heavy cloudburst rainfall over the watershed of the Little Pigeon River above Pittman Center resulted in a disaster that will long be remembered. Storms such as this one but of even larger proportions and covering more of the watershed can produce much larger floods at Sevierville than was the case in August 1938.

The catastrophic character of this storm and flood are set forth in the following account from "The Sevier County Republican and The Sevier County Record" for Wednesday, August 13, 1938:

CLOUDBURST TOLL IN SMOKIES IS EIGHT, WEBB'S CREEK
IN PITTMAN CENTER SEEMS THE WORST DISASTER, BODIES
OF VICTIMS FOUND, HOMES, STORES, BRIDGES, AND
AUTOMOBILES SWEEPED INTO RAGING TORRENT

Last Friday morning the worst known flood in Sevier County in many years swept down from the mountainsides from a cloudburst, swelling creeks and rivers into raging torrents. A toll of eight lives was taken.

In addition to the human lives taken, damage to property will amount into thousands. Mr. and Mrs. Joe Green and two children who lived on the banks of Laurel Creek managed to flee to safety a few minutes before their home was swept downstream. Mr. and Mrs. Bart Green and eight children also fled to safety shortly before their home was crumbled like a matchbox by walls of water which they estimated at ten to twelve feet high. George Ramsey, another farmer living on Laurel Creek, and his wife and three children made a dramatic exit from the window of their home as it was being dragged into the stream. Ramsey said he looked at Laurel Creek shortly after 2:00 a.m. and noticed it was rising rapidly. He decided to leave at once. Just as he got his family through the window nearest to high ground, the house was torn from its foundation and sent swirling downstream. Homes of Elijah Ramsey and Willard Parton were destroyed. They moved to higher ground in time to escape the flood. Pittman Center was marooned. Bridges from Gatlinburg and Sevierville connecting with the Center were washed out. Several swinging bridges and those of wooden construction were torn from their supports.

Ernest Thurman and Lee Huskey of Pittman Center escaped death in a manner almost as miraculous as that of the Ramsey family. The two men had parked their car near a bridge approach at the Center and alighted just as a torrent of water washed both bridge and car into the foaming stream.

Residents of the vicinity of Laurel, Ball Branch, and Webb Creeks reported the downpour was the worst in years and that never before had as many lives been lost and as much property destroyed.

Residents of Sevierville were surprised at daylight Friday morning to note that the river was gradually creeping into town. Main Street was flooded from the Square up to the east end of Main Street and from Main Street up Park Road to the corner of Bruce Street.

At Gatlinburg the rain brought Roaring Fork to its highest level in 50 years. The creek washed away the Sam King Store and destroyed the tourist cabin of Oscar Bohannon. In addition to the above, many thousands of dollars in damage has been done to growing crops along the bank. Corn and tobacco were the crops that suffered the most. Many mules, horses, and cattle were also reported drowned along the swollen streams.

December 29, 1942

This was a flood of moderate size which "The Sevier County Republican and The Sevier County Record" for Wednesday, December 30, 1942, describes as follows:

PIGEON RIVER ON RAMPAGE, TIDE OF TWELVE FEET,
HIGHEST IN FOUR YEARS, DOES LITTLE DAMAGE

Continuous rains for the past several days, together with the snow melting in the mountains, brought a tide of more than twelve feet to the Pigeon River. Upper Main Street and Park Road almost to the telephone office were under water. Some inconvenience to the home owners was experienced but little or no damage was reported in the town. Below Sevierville the river flooded the pike as far down as the railroad crossing and people living in that vicinity were forced to go to higher ground.

In the tide passing Sevierville, small outbuildings, chicken houses, bridges, and fences were observed floating in the current. So far as reported, no lives were lost.

January 20, 1947

Due to winter rains covering the watersheds of many streams in East Tennessee, floods occurred on streams throughout the region. At Sevierville, the Little Pigeon River experienced a sizable flood, mention of which is found in "The Knoxville Journal," Tuesday, January 21, 1947.

E-T FLOOD WATERS BEGIN TO RECEDE AS RAIN HALTS

Meanwhile residents of several East Tennessee towns, including Kingsport, Gatlinburg, Sevierville, and Elizabethton, were also battling flood waters.

Gatlinburg and Sevierville probably were the worst hit, Gatlinburg having been more than a foot under water in most places for several hours.

Residents of nearby Sevierville were in the dark for more than two hours. Lights were doused when a slide on Chandler's hill, east of the city, smashed down a power pole, severing electric wires for several hundred feet.

Water, as in Gatlinburg, was ankle-deep on the town's main street and most of the business district it was learned.

More than 300 families in both towns were stranded or had to evacuate, it was reported.

However, students of three county schools probably enjoyed the flood more than most people. They were given a holiday yesterday because of flooded roads.

With reference to this same flood, "The Sevier County Republican" for Wednesday, January 22, 1947, contains the following account.

RUTH'S LETTER TO HELEN

The high water was really frightening this morning. They say the water was in town more than it had been in years. The river was fascinating to watch here this morning. Such waves! Then, the wind got up so strong that it would blow these waves into a spray. I had never seen this done here before but it was pretty to watch, as much as I hate wind.

The water is receding now and I am glad. I only hope it doesn't rain again tonight. It lifted our morale wonderfully today when the sun shone. In four weeks, they tell me, it has rained every day but two.

October 31, 1949

"The Knoxville Journal" for Tuesday, November 1, 1949, gives the following account of this rather moderate flood:

STREETS FLOODED IN GATLINBURG AND SEVIERVILLE

Sevierville, Oct. 31--The Little Pigeon River was back in its banks tonight after flooding both Sevierville and Gatlinburg and blocking Sevier County traffic for several hours this morning.

At Gatlinburg, State Highway Patrol Sgt. Carson Webb said he rowed down the main street in a skiff at the height of the flood. Homes and shops were flooded and some vacationers had to leave their cabins, it was reported, but City Manager Herbert F. Holt said traffic was flowing smoothly and most of the debris had been cleaned up by this afternoon. Shop owners and residents had been warned to move their furniture and goods to prevent damage by the high water.

Traffic was routed around Sevierville's main street which was under three to four feet of water for several hours.

"The Press," Gatlinburg, Tennessee, Thursday, November 3, 1949, carried the following story with regard to the October 31, 1949, flood:

DAMP--BUT NOT DROWNED

Press and radio reports to the contrary and despite a nearly constant rainfall for the past 36 hours the citizens of Gatlinburg have not yet had to swim. Things were mighty wet but not inundated as yet. The rain started last Saturday midnight and at noon Tuesday showed no signs of abating. The peak of the high water came about 3 a.m. Monday morning, when the Little Pigeon River rose rapidly, overflowing its banks and even covering the hand railing of the bridge that leads into the Hotel Greystone. However, the bridge was not damaged; in fact the only damage done by the high water was to wash away the foot bridge crossing the Little Pigeon into the home of Mrs. J. C. Howard at Laurel Springs Lodge, and the bridge into the property of E. Luke Bettis, below the Beer Barn at the junction of the Little Pigeon River and Dudley Creek, and to enter some basements and cabins in town. This was the highest the water has been in this vicinity for many years. Said a spokesman for the Hotel Greystone, "This was the first time I can remember that the river has come up high enough to cover the handrailing on our bridge. It has covered the floor of the bridge on several occasions, but never the railings."

The waters have receded several feet since Monday morning, are now well below the bridge, and the water is draining off as fast as it is coming down.

March 29, 1951

This flood was one of moderate height at Sevierville and was investigated immediately after it occurred by engineers of TVA's Hydraulic Data Branch. The flood came as the result of a 40-hour rainfall which totalled about 7 inches over the headwaters and $2\frac{1}{2}$ inches near the mouth of the Little Pigeon River. Runoff was relatively higher on the West Fork than on the Little Pigeon above Sevierville. On West Fork, the flood was reported to be the highest since June 1928.

Profiles of the high water crests on both Little Pigeon River and West Fork are shown on Plates 8 and 9. The flood was generally from 1 to 2 feet lower than the recent flood of January-February 1957.

At Sevierville both the Little Pigeon River and West Fork were out of banks but the aggregate damages were small. West Fork flooded the broad bottoms west of the business district but caused little damage since this area was not built up or being cultivated at the time of the flood. Little Pigeon River left its banks at the mouth of Middle Creek,

flooded one block in the residential district and followed the low area westward through the business district, crossing Park Street and Court Avenue entering West Fork below the railroad bridge. Four houses were flooded and 15 others were surrounded by water. The Sevierville Hardware Company was flooded but goods had been raised to a safe height in advance of the flood. The company's storeroom served as a channel through which water flowed from one part of the Little Pigeon River side of the business area to a low area leading to West Fork.

At Sevierville Mills, the turbine was stopped during the flood as protection against floating timbers and debris.

Highways in the Sevierville vicinity were flooded by both the Little Pigeon and West Fork.

Agricultural lands in the flood plains bordering the rivers in the Sevierville vicinity and downstream to the mouth in the French Broad River were inundated by the flood water. However, damages were negligible since there were no growing crops at the time of the flood and 1951 crops had not yet been planted.

"The Press," Gatlinburg, Thursday, April 5, 1951, reported that;

In Sevierville the river rose and covered Main Street and nearly half the city block toward Bruce Street. Many residences were partially marooned and business life in the city was disrupted until the water subsided later in the afternoon.

April 16, 1956

"The Sevier County News-Record," Thursday, April 26, 1956, published photographs of scenes in Sevierville during this rather moderate flood. Two of these are reproduced in this report in Figure 2. The newspaper stated that "although numerous homes were flooded and highways were blocked, no serious damage or injuries were reported. . . . Water covered Highway 211 and 441 about six miles from Sevierville, causing traffic to detour to the old Knoxville highway."



Figure 2.--APRIL 16, 1956, FLOOD

Top photo is on Riverside Drive and shows depth of overflow in one of Sevierville's areas of low elevations. Bottom photo is looking across Little Pigeon River and the Sevierville Mills Dam from the left bank.

(Photos reproduced by courtesy of "The Sevier County News-Record.")

February 1, 1957

This was one of the major floods that are known to have occurred at Sevierville, ranking sixth among such floods in a period of 90 years or more. This was the largest flood on Little Pigeon River since June 1928 and was about 8 inches lower than that flood. It was about 2 feet lower than the April 1920 flood. The flood was accompanied by widespread overflow in the business and residential sections of Sevierville. Scenes in Sevierville during this flood are shown on the cover and in Figure 3 of this report. The flood was investigated on the ground immediately after its occurrence by engineers of TVA's Hydraulic Data Branch.

Rainfall over the Little Pigeon River watershed was heavy during the six-day period from January 26 to February 1 during which rainfall of from $7\frac{1}{2}$ to nearly 11 inches fell over the watershed. Of these amounts from 4 to 6 inches fell in the last 3 days from January 30 to February 1. Streams began rising early on January 27. At Sevierville the Little Pigeon River was up and down twice before the morning of January 31. Late on Wednesday, January 30, the intensity increased sharply for a 24- to 30-hour period. This heavier rain started a steady rise about midnight of January 30 which continued to the crest of 14.71 feet in the early morning of February 1 about 25 hours later.

Little Pigeon River broke out of its banks above Sevierville at midmorning on Thursday, January 31. Merchants began moving their goods to higher elevations and work of evacuating families began. The water continued to rise through the afternoon and until just after midnight when the crest occurred. At that time water was 18 inches over the street floors in some stores. Damages were generally small because merchants had sufficient advance indications of the flood to give time for moving and raising stock and equipment to above the flood crest. Considerable damage resulted to offices in basements. Between 300 and 400 families were moved out and water flooded some 50 homes.

Water over the roads stopped traffic for most of Thursday night on Tennessee Highway 66 from Sevierville north, on the old Knoxville Highway on the left bank of Little Pigeon River below Sevierville and on many secondary roads. Autos were able to drive through the water in most of the Sevierville streets throughout the flood. Schools were closed in



Figure 3.--FLOOD OF JANUARY-FEBRUARY 1957

Business places and residences were flooded by this recent flood. The top photo is on Riverside Drive on the morning following the flood crest, the water level having receded about $1\frac{1}{2}$ feet from the crest. The bottom photo was taken on Court Avenue on the night of the flood.

(Both photos reproduced by courtesy of Bashor's Photos, Sevierville, Tenn.)

Sevierville on Friday and throughout most of the county all the following week because of roads which had been badly damaged by the overflow and by slides. Water remained in Sevierville streets most of Friday and firemen were busy pumping out flooded basements.

"The Sevier County News-Record" contained much valuable information on this 1957 flood. The following abstracts are taken from the issue of February 7.

FLOOD IN VALLEY GREATEST IN YEARS

Sevierville Makes Quick Recovery Biggest Damage Is To County Roads

The flood all across the Tennessee Valley last week was the greatest in 74 years. All East Tennessee Creeks and rivers were running bank-full, Sevierville was hardest hit of near-by cities when tons of water cascaded down from high mountain sides only 15 miles away. The crest in Sevierville came about midnight on Thursday, January 31. Then the water was between 6 and 21 inches deep in some sections of town. About an hour after midnight Thursday the water began to recede. By Friday morning the water had run off almost as fast as it flashed upon the County Seat town lying in the hollow flat between the East and West Prong of the flooding Little Pigeon River.

City Damages Light

The cities of Gatlinburg and Sevierville suffered little damage by comparison with their neighbors in Kentucky, Virginia and West Virginia. . . . There were no lives lost or serious injuries reported in Sevier County caused by the flooding rivers.

.

Residential Sections Hit In Sevierville

The residential sections of Riverside Drive, McMahon Addition, Love Addition and old Knoxville highway were hardest hit in Sevierville. Hundreds of families left their homes for the night fearing that higher water was coming. About 50 homes took water as high as the main living floor. Damage to furniture and fixtures in these homes is estimated at several thousand dollars.

Tallent Home Hit Hard

. . . . When the high water took its heaviest toll in the Riverside Drive area the Tallent household was again the hardest hit. They lost all their furniture, appliances,

clothes, and other belongings to the muddy waters. It was the biggest loss reported.

Schools Closed

All county schools were closed Friday after the flood. School Board orders Monday closed all schools which were served by buses. This was necessary due to the poor condition of washed out roads and bridges. Gatlinburg schools, Chilhowee High School, DuPont Elementary School, and Park Road (Church of God) schools remained open.

Biggest Damage Was To Roads

Omer Green, County Superintendent of Roads faced the biggest clean-up job of all. Almost every road in the county suffered from wash-outs, slides, and small bridge damage. At least three hanging bridges (built years ago for walking traffic across the rivers) were put out of commission. The heavy rains brought on numerous rocks and dirt slides. On highway 441 just outside of Gatlinburg Park crews were busy all week pushing rock and mud off of the right-of-way. There was no delay in traffic on this section.

Highways Closed During Crest

During the high water mark Thursday night the following roads were temporarily blocked, Highway 66 to Douglas Dam, Old Knoxville Highway, Highway 73 between Gatlinburg and Maryville, and Newport Highway.

No Damage To Schools

The rain caused no serious damage to school properties. Pittman Center workers prevented several inches of water from flooding Pittman Center gym floor.

Everyone Helped During Emergency

Every Sevierville organization, church, and civic club had an active hand in assisting during the Thursday night hours. Hundreds of people were on hand to help merchants and residents in anything they could do. Private homes, motels, and hotels, all over the county were ready to care for any who thought it necessary to leave their homes.

W.S.E.V. Staff On The Ball

Radio station WSEV received permission early Thursday from the Federal Communication Commission to stay on the air continuously until the danger had passed. The station remained on the air until early Friday morning bringing minute by minute warning reports, so that citizens could prepare themselves for the flood.

Almost three inches of water fell here on Thursday. . . . Four (streets) in Sevierville had high water. They were Park Road, Main St., Bruce St., and Court Ave., although at no time was the water so high that automobiles could not drive through it.

Red Cross Offices Opened

Red Cross offices were opened Thursday night in the First Baptist Church, Sevierville and were later moved to the VFW building. The Knoxville Red Cross and numerous boat and rescue teams from nearby towns heard the call for help and came running. Between ten and twenty boat owners from Knoxville and Morristown hurried to Sevierville with boats and trailers, but as it turned out, they were not needed.

Downtown Damage

Damage to downtown Sevierville properties was considered slight when inventory was taken Friday. Most merchants made sure that valuable merchandise was raised off their floors. Worst damage was to office and records in the basement of the Sevierville Post Office. Workers were busy all Friday and Saturday salvaging piles of paper records. Red Cross examiners toured the area after the high water and found that damage was not extensive enough to declare the area a Red Cross disaster area.

Ray Sharp's Mark

Mr. Ray Sharp at the Sevierville Hardware has notched a counter in his store for every high water mark since the 1920 flood. The notch (at the front of the store) for 1920 is 19 inches off the floor. The notch for last week's water was 8 inches off the floor, although the water in the back of the store (which is lower) reached 17 inches deep.

Fireman's Work Doesn't Stop

Long after most folks had gone to bed Thursday night the men of the Sevierville Fire Department were pumping out basements. They stayed at the job all day Friday where-ever needed.

HIGH WATER IN SEVIERVILLE CAUSES SLIGHT DAMAGE TO MOST BUSINESS

Only Slight Damage Reported By Business Houses

The downtown section of Sevierville which received the most water in last week's high water was a square block bounded by Bruce, Court, Main, and Park Streets. Most merchants are somewhat accustomed to high water and were able to take early precautions against damage. The report of damage is as follows.

The article goes on to enumerate that 27 buildings on Bruce Street had water in them but caused no substantial damage. On Court Avenue there were 14 buildings with water in them but no great damage.

Bruce Street

(Twenty-seven business places were listed in the paper as being flooded to depths up to 16 inches with no significant damages at any place.)

Court Avenue

(Fourteen business places were listed as being flooded to depths up to 17 inches. Damages were small except at Wade's Department Store where 10 inches of flooding resulted in damages estimated at \$5,000 to \$6,000.)

Main Street

(Fifteen businesses were listed as being affected by the flood with damages slight except for 3 places, the description of whose damages is given in "The Sevier County News-Record" as follows:

Sevierville Mills had a near record amount of water which was still in the mill Friday morning and could not be measured. 350 bushels of wheat, which had just been unloaded, was destroyed; three electric motors were damaged, and it was necessary to remove sections of the floor to work on the motors. Mr. Clifford Frost, owner and operator, expecting the damage to run between \$3500 and \$4000. Water was within an inch of the record high of 1920.

.

Conner Pontiac had no water in the street level floor of the building, but water filled the basement which contained the furnace and car parts. Damage was expected to be approximately \$500.

.

Atchley's Funeral Home, no water on main floor, but water filled the basement. One furnace was covered by 6 feet of water. Sixteen inches of water was listed in Atchley's Garage.)

.

Post Office

Water filled the basement of the Sevierville Post Office within 9 inches of the ceiling. Desks, doors, windows, lights, file cabinets, and other office supplies were damaged. The Sevier County Soil Conservation Department reported that their "farm conservation plans" or maps were destroyed by the water, and it is estimated that it will take $2\frac{1}{2}$ years to replace them. Approximately one-half of all their records were destroyed. Records from the files of the Selective Service office were removed before the water filled the basement, however, other farm agency offices located in the basement of the post office reported losing all or most file papers and records.

Court House

Approximately 18 inches of water flooded the office of Dave Hendrix, Sevier County Agent. Some records and stock supplies were destroyed. Other offices in the basement of the court house were also covered with approximately 18 inches of water. The water, however, came up through a drain pipe or sewer line in the hall of the basement. Pumps kept most of the water out. Furnace kept burning.

Jail

Approximately four feet of water filled the offices in the basement of the Sevier County Jail, in which the offices of the Sevier County Welfare Department are located. Three desks, two file cabinets, chairs and other office equipment and furniture were destroyed. Records and papers, however, were removed. A large room of clothing was covered by the water, and most or all of the clothing was believed to be destroyed. The furnace, which supplies heat for the entire building was out of order until Friday. Electricity was also off in the jail, until a special line was installed, and supplied electricity for the main floor of the jail.

West Fork Little Pigeon River Floods

In order to provide information on floods on West Fork, a special investigation of these covering the lower 9 miles of the West Fork Little Pigeon River was made in March 1958 by J. W. Beverage of TVA's Hydraulic Data Branch.

This investigation established that the highest flood remembered by anyone now living in this reach of the river occurred in 1896. The second highest witnessed flood occurred in 1920. The third highest in the lower 5 or 6 miles of the river was in 1957. A flood in 1928 exceeded the 1957 stage in the upper 2 miles of the nine-mile reach. This information was obtained by interviewing residents who were living along the river and who actually saw the floods at the time of their occurrence.

The great flood of 1896 was witnessed by Mr. John A. Seaton, age 83. Mr. Seaton lives on the left bank of West Fork Little Pigeon River at Mile 4.95. He moved into the house at this location in 1880 at the age of 5 and has lived there ever since.

Mr. Seaton tells this story in connection with the 1896 flood. It occurred during the first week in April a year after he was married in 1895. The date is well remembered because Mr. and Mrs. Seaton were expecting their first child at that time. On the date of the flood, Mr. Seaton had made an early morning trip to his blacksmith shop on the bank of the river and across the road from his home. It had rained all night and was "pouring it down" then. There was a "terrible roaring in the mountains" so Mr. Seaton decided to put his blacksmith tools up on a high shelf in the shop to keep them out of flood waters. About that time his neighbor, a Mr. King, came walking up and, after a short conversation about the weather, the two decided to move Mr. King's family and livestock to higher ground. Mr. King's residence stood on ground several feet lower than that at the Seaton home. After completing the move, they watched the river rise until its crest at about 10:00 a.m. At the crest, water just lapped under the fence at the side of the house, according to Mr. Seaton. Mr. Seaton described the flood as being several feet higher than anything since. This high water level is approximately 4.5 feet higher than the 1920 flood.

Mr. Seaton's grandparents settled in the vicinity of the present Seaton home in 1820. Mr. Seaton stated that he had always been told that one flood higher than that of 1896 had been witnessed by some of these early settlers. The date of its occurrence is not known, but it could well have been in 1875. Mr. Seaton's information does establish that the 1896 flood was probably the second highest in the past 138 years.

Mr. W. A. Sharp, age 83, has spent his life in a house that stands on the right bank of West Fork Little Pigeon River less than a half-mile downstream from the Seaton home. Mr. Sharp stated to Mr. Beverage that the highest stage in his time put water around the roots of an old hackberry tree standing in the front yard of his home. Mr. Sharp was ill at the time of Mr. Beverage's interview with him and could not be questioned closely as to the date of the occurrence, but he did say it was a long time ago. Elevation of the spot reached by the water as told by Mr. Sharp established that it was probably the 1896 flood as it was in agreement with the Seaton high water mark.

No other information could be obtained in connection with the 1896 flood or floods prior to that one.

Mr. Charles Henderson, age 64, who has spent his life at his present home on the right bank of West Fork Little Pigeon River at Mile 6.9 gave information on floods at that location. He has observed floods on the river since he was a boy. He took Mr. Beverage to an old cedar tree standing on a rock outcrop at Mile 7.07. On this tree were five notches and, according to Mr. Henderson, they represent all major floods since 1908. The tree and the flood marks are shown in the photograph, Figure 4. The top notch represents the 1920 flood. A notch one-half foot below it is supposed to represent a flood that occurred in 1928, although there is some question in Mr. Henderson's memory about this date. This date, however, would be consistent with the sequence of flood heights on the Sevierville stream gage on Little Pigeon River. The third notch is 0.97 foot below the 1920 mark and is the 1957 flood. A 1908 flood is notched 1.45 feet below the 1920 crest and a June 1932 flood is 2.05 feet below the 1920 mark.

Another tie to the 1920 flood was made on the left bank at Mile 2.25. Mr. C. M. Marshall was living at this location in 1920. He

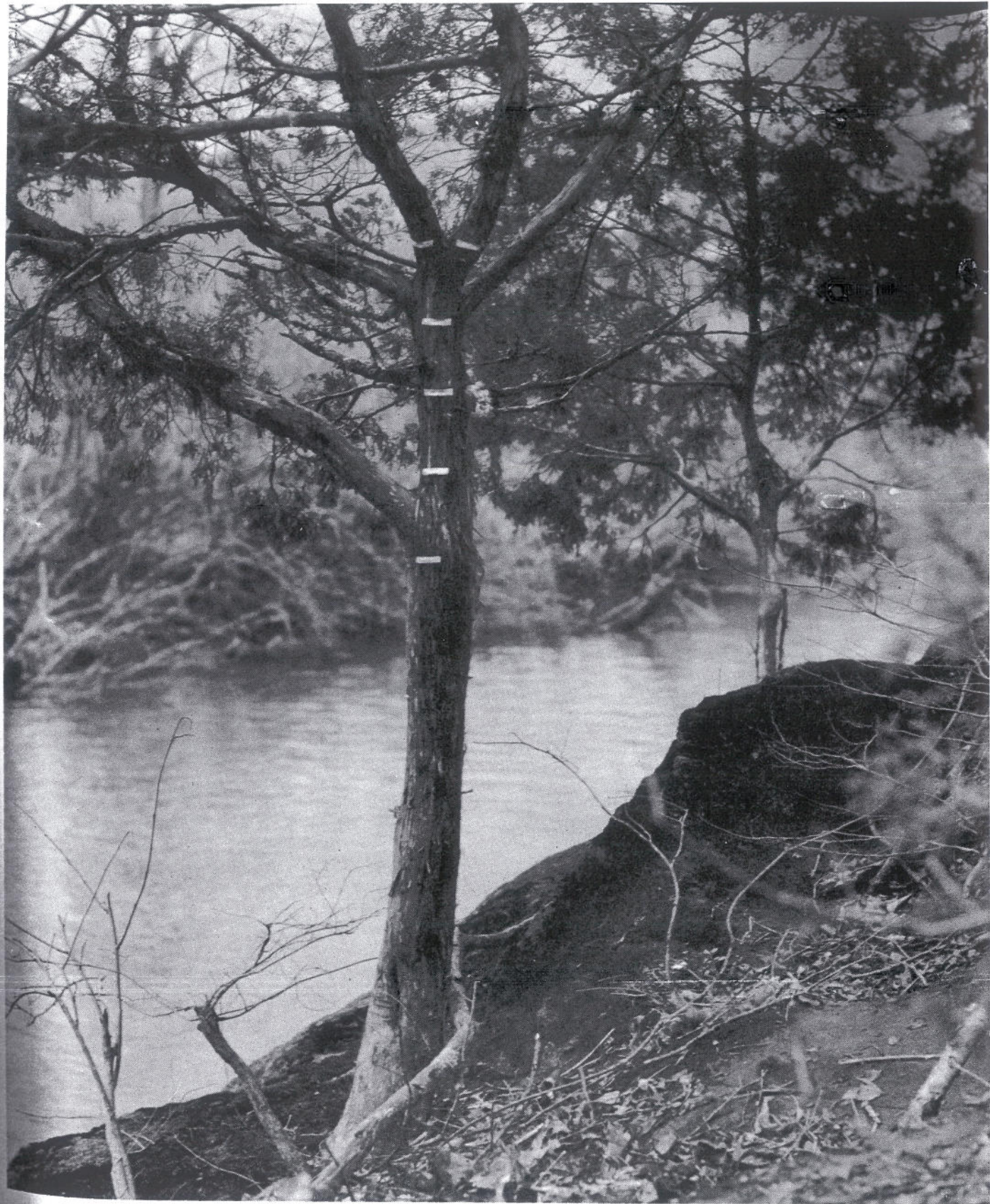


Figure 4.--HIGH WATER MARKS ON WEST FORK

On this old cedar tree on the bank of West Fork Little Pigeon River 7 miles above the mouth, Mr. Charles Henderson cut notches marking the height of five major floods on that stream, all that have occurred since 1908. In order from the top are the floods of 1920, 1928 (?), 1957, 1908, and 1932. The top and bottom marks are 2.05 feet apart. (In order for the marks to show in the picture, a strip of white tape was placed over each notch.)

Photograph by James W. Beverage.

remembered that a flood that year reached to about the top of the second step in front of the house. Mr. Marshall was also at the house during the night of the 1957 flood. He had gone there to make certain that his son's family were in no danger from flood waters. Mr. Marshall stated that the 1957 flood was about a foot under the 1920. Our elevations established the difference to be about 0.8 foot.

ACKNOWLEDGMENTS

This section of the report has been prepared by personnel of the Hydraulic Data Branch, Division of Water Control Planning, under the general direction of Reed A. Elliot, Chief Water Control Planning Engineer, and the immediate supervision of Albert S. Fry, Chief, Hydraulic Data Branch. Field investigations were made under the direction of James W. Beverage, Head of the Field Investigations Section. High water investigations in the field were carried out by District Engineer William P. Clark, assisted by Area Engineer John W. Weathers.

Thomas C. Bounds, Head of the Office Engineering Unit, prepared charts and maps for the report under the direction of Paul C. Spath, Head of the Hydraulic Investigations Section. Newspaper files at Sevierville, Gatlinburg, and Knoxville were searched for flood information by John H. Scott, Jr., Hydraulic Investigations Section, and Joyce Morgan, Field Investigations Section.

This report was prepared by the Branch Chief, assisted by District Engineer Myron O. Jensen and other members of the Branch.

II.
PAST FLOODS
ON
STREAMS
IN
SEVIERVILLE REGION

Tennessee Valley Authority
Division of Water Control Planning
Hydraulic Data Branch

II.

PAST FLOODS ON STREAMS IN SEVIERVILLE REGION

Large floods have been experienced in the past on streams in the general geographic and physiographic region of Sevierville, Tennessee, as a result of heavy rain storms that have occurred over the watersheds of these streams. Such storms, except for the vagaries of the weather, could just as well have occurred over the Little Pigeon River and West Fork Little Pigeon River watersheds. Had they done so, floods would have resulted on the Little Pigeon and West Fork Little Pigeon Rivers comparable in magnitude to those that happened on the neighboring streams. It is therefore desirable in connection with any determination of floods that may occur on the Little Pigeon River and West Fork Little Pigeon River in the future to consider the floods that have occurred on streams in the Sevierville region and whose watersheds are similar in physical characteristics to the Little Pigeon River watershed. Such characteristics include both topography and watershed cover.

Maximum Known Regional Floods

Table 6 contains a list of the maximum known floods that have occurred on streams in the region of Sevierville which is considered in this report to be within 75 miles of the town and whose watersheds are similar in physical characteristics and cover to that of the Little Pigeon River. This necessarily limits the neighboring streams considered to those whose watersheds lie in the Great Smoky Mountains region, and eliminates those to the west of Sevierville whose headwaters lie in the Great Valley, since streams in that location differ greatly in watershed characteristics from those of the Little Pigeon and West Fork Little Pigeon Rivers. The upper French Broad River watershed has been omitted from this study because of topographic differences between it and the Little Pigeon River watershed.

TABLE 6
MAXIMUM KNOWN DISCHARGES
ON STREAMS IN GENERAL REGION OF
SEVIERVILLE, TENNESSEE

All floods listed occurred within 75 miles of Sevierville.

Reference No. *	Stream	Location	Drainage Area sq.mi.	Date of Flood	Peak Discharge Per Sq.	
					Amount cfs	Mile cfs
1	Little Tenn. River	at Judson, N. C.	664	Mar. 1867	50,000	75
22	Tuckasegee River	at Bryson City, N. C.	655	May 1840	30,000	137
3	Nolichucky River	at Poplar, N. C.	608	May 1901	84,000	138
4	Pigeon River	at Hartford, Tenn.	547	Feb. 28, 1902	52,000	95
5	Little Tenn. River	at Needmore, N. C.	436	Feb. 1902	42,000	96
6	Little Pigeon River	at Sevierville, Tenn.	353	Apr. 2, 1920	37,000	104
7	Little Pigeon River	at Sevierville, Tenn.	353	Feb. 25, 1875	55,000	156
8	Tuckasegee River	at Dillsboro, N. C.	347	May 1840	53,000	153
9	Little Tenn. River	at Iotla, N. C.	323	Feb. 28, 1902	38,000	118
10	Nottely River	near Ranger, N. C.	272	Nov. 1906	24,500	90
11	Tellico River	near Vonore, Tenn.	271	Mar. 29, 1951	14,900	55
12	Little River	at Maryville, Tenn.	269	Mar. 15, 1875**	60,000	223
13	Hiwassee River	below Hayesville, N. C.	252	Oct. 4, 1898	24,000	95
14	Little River	at Walland, Tenn.	192	Mar. 15, 1875**	50,000	260
15	Cheoah River	at Johnson, N. C.	177	Nov. 19, 1906	40,000	226
16	Ivy River	near Marshall, N. C.	158	June 1876	14,000	89
17	Cane River	near Sioux, N. C.	157	May 1901	31,000	198
18	Nantahala River	at Nantahala, N. C.	144	Mar. 1867	19,000	132
19	Tuckasegee River	at Tuckasegee, N. C.	143	Aug. 30, 1940	40,800	285
20	Oconaluftee River	at Cherokee, N. C.	131	May 1840	17,500	134
21	Big Laurel Creek	near Stackhouse, N. C.	126	July 1905	15,000	119
22	Tellico River	at Tellico Plains, Tenn.	118	May 1840	21,500	182
23	Valley River	at Tomotla, N. C.	104	Sep. 1898	32,000	308
24	Cullasaja River	at Cullasaja, N. C.	86.5	Feb. 28, 1902	18,000	208
25	E. Fk. Tuckasegee River	near Tuckasegee, N. C.	80.3	Aug. 30, 1940	30,000	370
26	Jonathan Creek	near Cove Creek, N. C.	65.3	Feb. 1902	5,100	78
27	W. Fk. Tuckasegee River	at Glenville PH, N. C.	52.5	Aug. 30, 1940	14,000	267
28	Cataloochee Creek	near Cataloochee, N. C.	49.2	Feb. 23, 1927	8,000	163
29	Caney Fork	above Cowarts, N. C.	39.4	Aug. 30, 1940	21,700	551
30	W. Fk. Pigeon River	at Lake Logan Dam, N. C.	32.8	Aug. 30, 1940	14,900	454
31	W. Fk. Little Pigeon River	above Gatlinburg, Tenn.	14.6	Sep. 1, 1951	12,000	820

* Reference number refers to locations shown on Key Map, Plate 4.

** Date uncertain, flood may have occurred in February 1875.

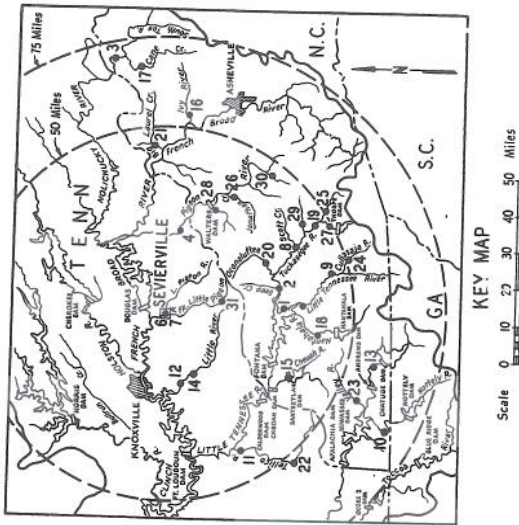
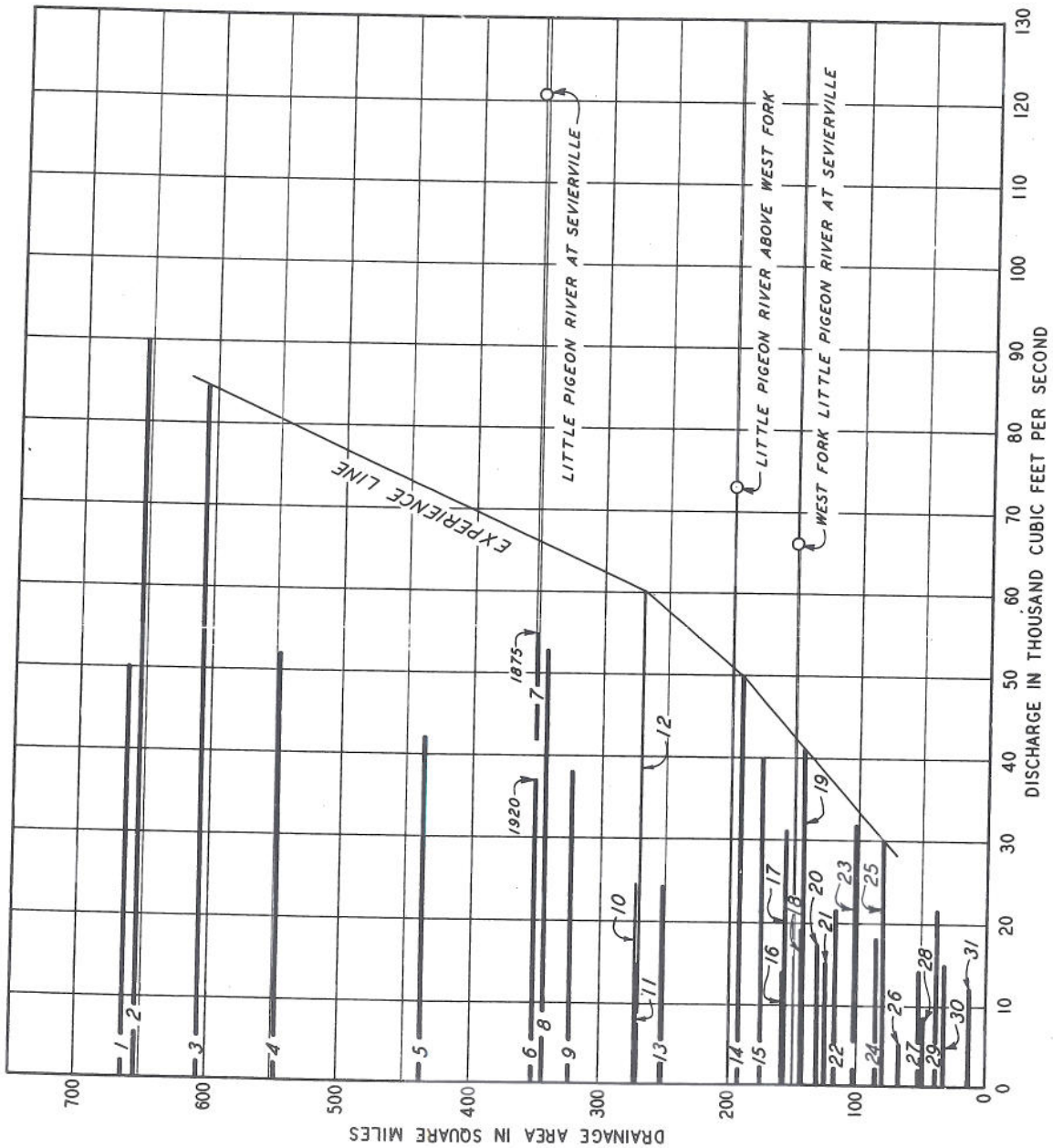
Floods that were known to have occurred from Atlantic coast hurricanes are not included in Table 6. Such storms could not logically be transposed from the southeast across the Smoky Mountains to the Little Pigeon River watershed.

Among the earliest large storms in the region is that of May 1840 on the Tuckasegee River. The highest known flood on the Little Pigeon River occurred in February 1875. The flood of May 1901 on the Nolichucky River was caused by one of the most severe storms known in the upper eastern part of the Tennessee Valley, particularly along the Watauga River and lower portions of the French Broad and South Fork Holston Rivers. The most recent large storm in the region, in late August 1940, caused one of the highest known peak discharges on the upper Tuckasegee River. Large floods in mid-August 1940 in western North Carolina, which were caused by hurricane rains, were not included in Table 6.

The floods listed in Table 6 have all occurred on physically similar watersheds in the general region of Sevierville. This indicates that floods of like magnitude, modified to take into account significant differences in drainage area characteristics, may occur in the future on Little Pigeon and West Fork Rivers at Sevierville.

Little Pigeon and West Fork Little Pigeon Rivers vs. Regional Flood Discharges

The flood discharges that have been tabulated in Table 6 have been plotted on Plate 4. This chart shows graphically for drainage areas of various sizes the maximum flood discharges that have been experienced on streams of similar characteristics in the Sevierville region. The key map on Plate 4 shows the locations of the streams for which the discharges are plotted and listed in Table 6. Included in Table 6 and on Plate 4 are the Little Pigeon River at the stream gage at Sevierville and the West Fork Little Pigeon River near Gatlinburg. Plate 4 shows that the flood of February 1875 on the Little Pigeon River, the largest known flood at Sevierville, approaches in magnitude the maximum discharges that have been experienced on other streams with comparable drainage areas to that of the Little Pigeon River. Somewhat higher peak discharges in relation to drainage area occurred on the Tuckasegee River in May 1840 and August 1940, on Little River in March 1875, and on the Nolichucky River in May 1901.



Numbers on chart refer to those on Key Map & on Table 6.
 O ---- Estimated Maximum Probable Flood determined
 by Flood Control Branch.

TENNESSEE VALLEY AUTHORITY
 DIVISION OF WATER CONTROL PLANNING
 HYDRAULIC DATA BRANCH

MAXIMUM KNOWN FLOOD DISCHARGES REGION OF SEVIERVILLE, TENNESSEE FEBRUARY 1958

Plate 4 shows by open circle symbols the magnitude of the Maximum Probable Floods for the Little Pigeon and West Fork Rivers. These are discussed in Section III of this report.

Based only on consideration of the flood discharges that have been experienced on streams in the Sevierville region, it would be reasonable to expect peak discharges in the order of 66,000 cubic feet per second on Little Pigeon River below the mouth of West Fork, 51,000 cubic feet per second above the mouth of West Fork and 43,000 cubic feet per second on the West Fork Little Pigeon at the mouth.

Flood Heights for Various Discharges

The peak discharge for the flood of February 1, 1957, was 27,300 cubic feet per second at the stream gage below Sevierville. In order to show the height of floods with greater discharge than the 1957 flood as compared to that flood, Table 7 has been prepared. The 1957 flood is so recent that it is doubtless still fresh in the memories of the people at Sevierville.

TABLE 7

RELATIVE FLOOD HEIGHTS FOR VARIOUS DISCHARGES

LITTLE PIGEON RIVER AT SEVIERVILLE

AT STREAM GAGE

<u>Date of Flood</u>	<u>Estimated Peak Discharge in Cubic Feet Per Second</u>	<u>Feet Above 1957 Flood</u>
February 1, 1957	27,300	0.0
March 1875	55,000	3.3
-	66,000	4.0
-	90,000	6.1
-	121,000	8.8

The elevations of discharges greater than that of 1875 are shown by ticks on the profile, Plate 9, at the stream gage location below the West Fork Little Pigeon River, Mile 4.53.

For the Little Pigeon River above the West Fork, the following table presents similar relative flood height data.

TABLE 8
RELATIVE FLOOD HEIGHTS FOR VARIOUS DISCHARGES
LITTLE PIGEON RIVER ABOVE THE WEST FORK

MILE 5.48

<u>Date of Flood</u>	<u>Estimated Peak Discharge in Cubic Feet Per Second</u>	<u>Feet Above 1957 Flood</u>
February 1, 1957	14,000	0.0
February 25, 1875	25,000	1.8
-	51,000	6.2
-	73,000	9.9

The elevations of discharges greater than that of 1875 are shown by ticks on the profile, Plate 9.

For the West Fork Little Pigeon River, the relative flood height data are given in the following table.

TABLE 9
RELATIVE FLOOD HEIGHTS FOR VARIOUS DISCHARGES

WEST FORK LITTLE PIGEON RIVER

MILE 0.94

<u>Date of Flood</u>	<u>Estimated Peak Discharge in Cubic Feet Per Second</u>	<u>Feet Above 1957 Flood</u>
February 1, 1957	13,300	0.0
February 25, 1875	30,000	3.1
-	43,000	5.5
-	66,000	9.5

The elevations of floods greater than that of 1957 are shown by ticks on the profile, Plate 10.

Regional Flood from French Broad River

The effect of large floods on the French Broad River resulting in backwater flooding along the Little Pigeon River below Sevierville has been discussed in Sections I and III of this report. The largest floods of the past on the French Broad were those of 1867 and 1875. Evidence indicates that these are the largest floods on the French Broad in at least 132 years. Floods of comparable magnitudes to that of 1867 are known to have occurred on other large rivers in the eastern part of the Tennessee River Basin.

Since this is the case, it is reasonable to consider that the elevation of the 1867 flood, as regulated by Douglas Reservoir, at the mouth of Little Pigeon River is appropriate as the elevation for a regional flood on the French Broad River. Backwater flooding up the Little Pigeon can then be considered as starting at the mouth of the Little Pigeon at elevation 877.6 which is that for the 1867 flood on the French Broad under regulated conditions.

Acknowledgments

This section of the report has been prepared by personnel of the Hydraulic Data Branch, Division of Water Control Planning, under the general direction of Reed A. Elliot, Chief Water Control Planning Engineer, and the immediate supervision of Albert S. Fry, Chief, Hydraulic Data Branch. The flood studies were made under the direction of Willard M. Snyder, Head of the Hydrology Section, by Roger P. Betson.

III.

MAXIMUM PROBABLE FLOODS

Tennessee Valley Authority
Division of Water Control Planning

III.

MAXIMUM PROBABLE FLOODS

The preceding sections of this report have presented an account of the floods that have already occurred on the Little Pigeon and West Fork Little Pigeon Rivers in the vicinity of Sevierville, Tennessee, and of large floods known to have occurred in the region in which Sevierville is located on streams of similar physical watershed characteristics to those of Little Pigeon River. This section of the report is concerned with the Maximum Probable Floods at Sevierville. In particular, the basis for the Maximum Probable Floods that may reasonably be expected to occur is described, and the extent of the flood plain that would be affected by those floods is discussed. Floods of this magnitude are of the kind considered in planning protective works the failure of which might be disastrous.

Great floods on the French Broad River affect the lower reaches of Little Pigeon River by backing up that stream as pointed out previously in Section I of this report. Despite the fact that floods as large as any experienced in the past on the French Broad River would be reduced very materially by storage in Douglas Reservoir, that reservoir does not have sufficient storage capacity to reduce the Maximum Probable Flood on that stream to the same extent.

Extreme floods on the French Broad River in the vicinity of Sevierville are most likely to occur as a result of winter storms of fairly long duration when infiltration and other losses are small. Extreme floods on small watersheds such as those of Little Pigeon and West Fork Little Pigeon Rivers (drainage areas 201 square miles and 151 square miles, respectively, at their junction) may result from intense showers during a prolonged period of rainfall when infiltration and other losses are small, or from intense storms of the cloudburst type, which are most likely to occur in the summer.

Discharges of Maximum Probable Floods

As pointed out in the first section of this report, the maximum known floods on the French Broad River in the vicinity of Sevierville occurred in 1867 and 1875, the two being equal in height at the mouth of Little Pigeon River. The peak discharge in these floods at the mouth of Little Pigeon River is estimated to have been 150,000 cubic feet per second, and the crest elevation in each case was about 891.

The maximum known discharge on Little Pigeon River from its mouth to above Sevierville and also on West Fork at the mouth occurred in February 1875. At that time, as given in Section I of this report, it is estimated that the discharge on Little Pigeon River at the Sevierville stream gage was 55,000 cubic feet per second, on Little Pigeon River above West Fork 25,000 cubic feet per second, and on West Fork 30,000 cubic feet per second.

Even with regulation by Douglas Reservoir, it is reasonable to expect that floods greater than that of 1867 and 1875 will occur in the future on the French Broad River at the mouth of Little Pigeon River. It is also reasonable to expect that greater floods than those experienced in the past will occur in the future on both Little Pigeon and West Fork Little Pigeon Rivers.

In the determination of the Maximum Probable Floods on the French Broad River and on Little Pigeon and West Fork Little Pigeon Rivers, consideration was given to great storms and floods that have already occurred over the watersheds and to those that have occurred elsewhere but could have occurred over them.

When transferring storms from other areas, appropriate adjustments were made for differences in meteorological and watershed factors. When considering peak discharge rates on other streams, engineering judgment determined whether their application to the French Broad River, Little Pigeon River, or West Fork Little Pigeon River would be appropriate.

The effect of storage in Douglas Reservoir was taken into account in the determination of the peak discharge on the French Broad River.

In addition to the floods listed in Table 6 of Section II, the following Table 10 lists discharges for observed floods on several streams of approximately the size of Little Pigeon and West Fork Little Pigeon Rivers. For comparison, the discharge of the maximum known flood on each of these two streams is listed.

TABLE 10
SELECTED MAXIMUM OBSERVED FLOODS

<u>Stream</u>	<u>Location</u>	<u>Drainage Area sq.mi.</u>	<u>Year of Flood</u>	<u>Peak Discharge</u>	
				<u>Amount cfs</u>	<u>Per Sq. Mi. cfs</u>
Emory River	Gobey, Tenn.	25	1929	21,200	843
Triplett Creek	Morehead, Ky.	47.5	1939	50,000	1,050
Reedy Creek	Kingsport, Tenn.	57	1927	15,900	279
Emory River	Montgomery, Tenn.	81	1929	31,200	385
Sewee Creek	Decatur, Tenn.	117	1946	29,000	248
Whites Creek	Glen Alice, Tenn.	123	1929	57,000	463
New River	New River, Tenn.	312	1929	70,000	312
New River	New River, Tenn.	368	1929	74,700	203
Caney Fork River	Butts Bridge, Tenn.	375	1929	94,000	351
Emory River	Oakdale, Tenn.	764	1929	180,000	236
Little Pigeon River	Sevierville, Tenn.	201	1920	35,000	174
W. F. Little Pigeon River	Sevierville, Tenn.	151	1957	14,000	93

On the French Broad River at the mouth of Little Pigeon River the peak discharge of the Maximum Probable Flood with the regulation afforded by Douglas Reservoir was determined to be 325,000 cubic feet per second. This is more than twice the natural unregulated discharge of the 1867 flood.

From consideration of the flood discharges listed in Tables 6 and 10 and of the transposition to the Sevierville area of outstanding storms which have occurred elsewhere but can occur over the Little Pigeon

River watershed above Sevierville, the peak discharge of the Maximum Probable Flood for the West Fork Little Pigeon River was determined to be 66,000 cubic feet per second, for Little Pigeon River above the junction with the West Fork 73,000 cubic feet per second, and below the junction 121,000 cubic feet per second. These discharges are between two and three times the estimated discharges for the known maximum floods on those two streams.

Flood Crest Profiles and Overflow Areas

The crest profiles computed for the Maximum Probable Floods on the two streams in the vicinity of Sevierville are shown on Plates 9 and 10. They were computed using stream characteristics for selected reaches as determined from valley cross sections and observed flood profiles, and are based on channel conditions existing in 1957.

Backwater from the French Broad River Maximum Probable Flood, elevation 910, proved to be the controlling level on Little Pigeon River up to Mile 5.1 where the West Fork joins the Little Pigeon. At the mouth of the Little Pigeon River this is 19 feet higher than the elevations that were experienced in the natural unregulated floods of 1867 and 1875, the highest known floods on the French Broad River at the mouth of Little Pigeon River.

Upstream from Mile 5.1 on Little Pigeon River, the Maximum Probable Flood profile is from 5 to 8 feet higher than the elevations experienced in the flood of 1875. On West Fork Little Pigeon River, the Maximum Probable Flood profile is 8 to 15 feet higher than the elevations experienced in the flood of 1920. Over the portion of West Fork for which a profile of the 1896 flood is known, that flood is about 4 feet higher than the 1920 flood so that the Maximum Probable Flood would have a lesser margin over the 1896 than over the 1920 flood.

The limits of flood overflow areas in the vicinity of Sevierville are shown on Plates 5, 6, and 7. The elevations on Plates 9 and 10 and overflow areas shown on Plates 5, 6, and 7 have been determined as accurately as possible consistent with the basic data, but actual elevations may vary from those shown on the profile and map. The contour interval of the map is 20 feet, with occasional 10-foot contours, which does not permit precise plotting of the boundaries of the flooded areas.

The actual positions on the ground of the flooded areas may vary somewhat from those shown on the map. To determine flood elevations and limits with a higher degree of accuracy would require costly surveys and studies that are not warranted.

Velocities

During the Maximum Probable Flood, velocities in the main channel of Little Pigeon River would range up to about 17 feet per second, the highest occurring just above the junction with East Fork Little Pigeon River.

Velocities in the overflow area of Little Pigeon River would range up to about 5 feet per second.

During the Maximum Probable Flood, velocities in the main channel of West Fork Little Pigeon River would range up to about 16 feet per second, the highest occurring in the vicinity of the road bridge at Mile 2.62. Velocities in the overflow area of West Fork Little Pigeon River would range up to 4 feet per second.

Such velocities, in combination with the depth of flow, both in Little Pigeon and West Fork Little Pigeon Rivers would create a hazardous situation, particularly if the flood were to occur during the night.

Frequency

The frequency of a flood of the magnitude of that of the Maximum Probable Flood is not susceptible of definite determination. Such a flood would occur on the average only at rather long intervals of time, but it could occur in any year.

Possible Larger Floods

Floods larger than any of those discussed are meteorologically possible. However, the combination of meteorological factors that would be necessary to produce such floods would occur at very rare intervals, if at all. The consideration of floods of this magnitude is of greater importance in some flood problems than in others and should not be overlooked in the study of any flood problem. Such floods, because of their extreme rarity and uncertainty of occurrence on a given watershed,

need be considered only where dependence is placed on protective works, the failure of which would cause loss of life or destruction of valuable property.

Acknowledgments

This section of this report was prepared by the Flood Control Branch of the Division of Water Control Planning under the general direction of Reed A. Elliot, Chief Water Control Planning Engineer, and the immediate direction of Edward J. Rutter, Chief, Flood Control Branch. Basic hydraulic data were furnished by the Hydraulic Data Branch. Flood studies in the Flood Control Branch were under the supervision of B. J. Buehler, Head, Operation Studies Section. The flood discharges were determined by Donald W. Newton and the profiles were computed by Logan A. Gillett.



Base map reproduced from portions of 1940 edition of TVA-USGS topographic maps 156 NE and 156 SE.

Remains of fill on former Railroad to Douglas Dam.

LEGEND:

OVERFLOW LIMITS

Backwater from Maximum Probable Flood, Regulated, on French Broad River.

Jan.-Feb. 1957 Flood

M 5 — Miles above mouth.

Contour interval — 20 feet.



Base map reproduced from portions of 1940 editions of TVA-USGS topographic maps 156NE & 156NW.

Overflow areas developed by Hydraulic Data Branch.
Elevations for Maximum Probable Flood determined by Flood Control Branch.

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH

FLOODED AREAS
LITTLE PIGEON RIVER ABOVE
SEVIERVILLE, TENNESSEE

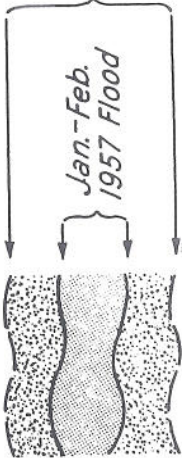


FEBRUARY 1958

OVERFLOW LIMITS

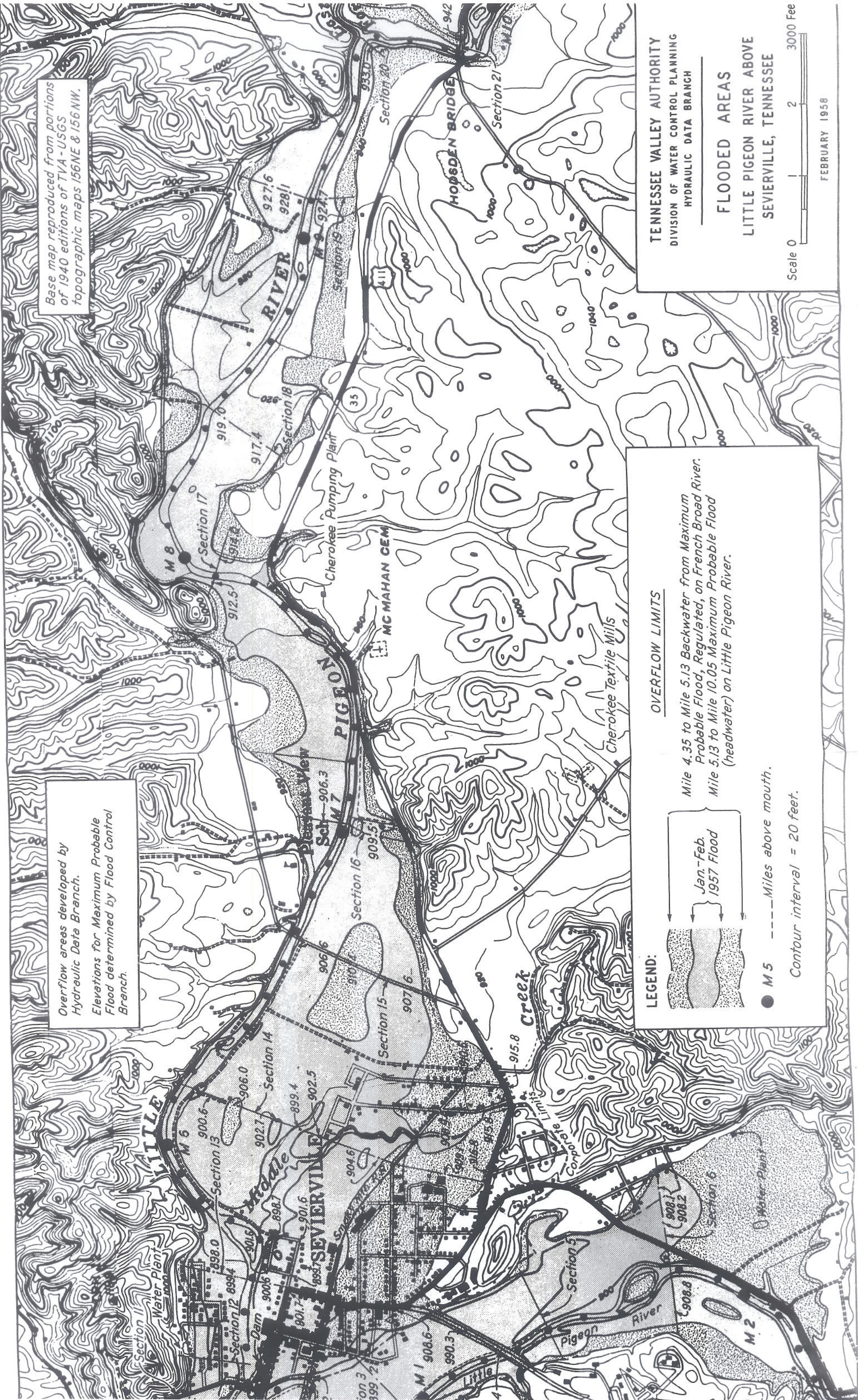
Mile 4.35 to Mile 5.13 Backwater from Maximum Probable Flood, Regulated, on French Broad River.
Mile 5.13 to Mile 10.05 Maximum Probable Flood (headwater) on Little Pigeon River.

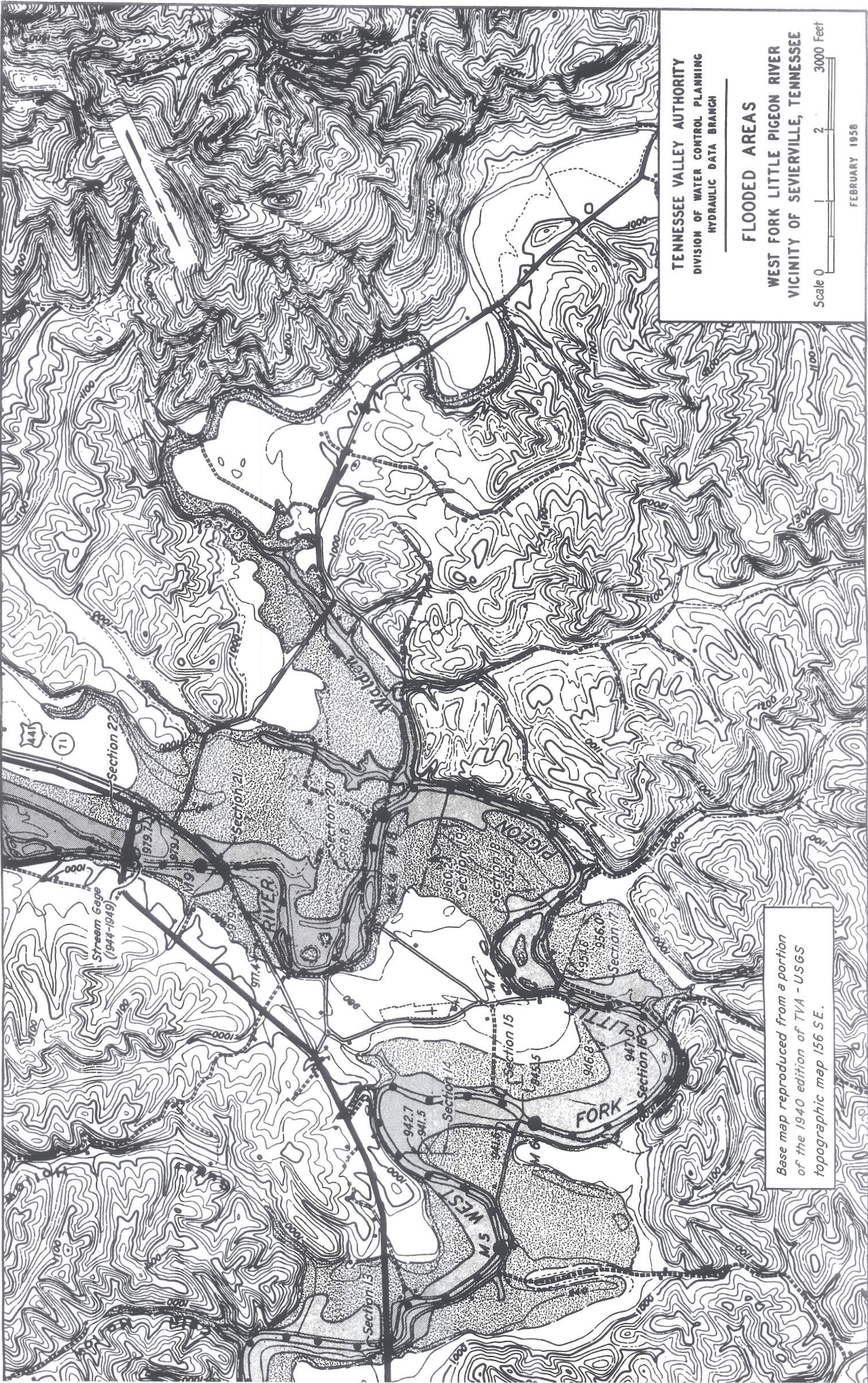
LEGEND:



● M 5 ----- Miles above mouth.

Contour interval = 20 feet.





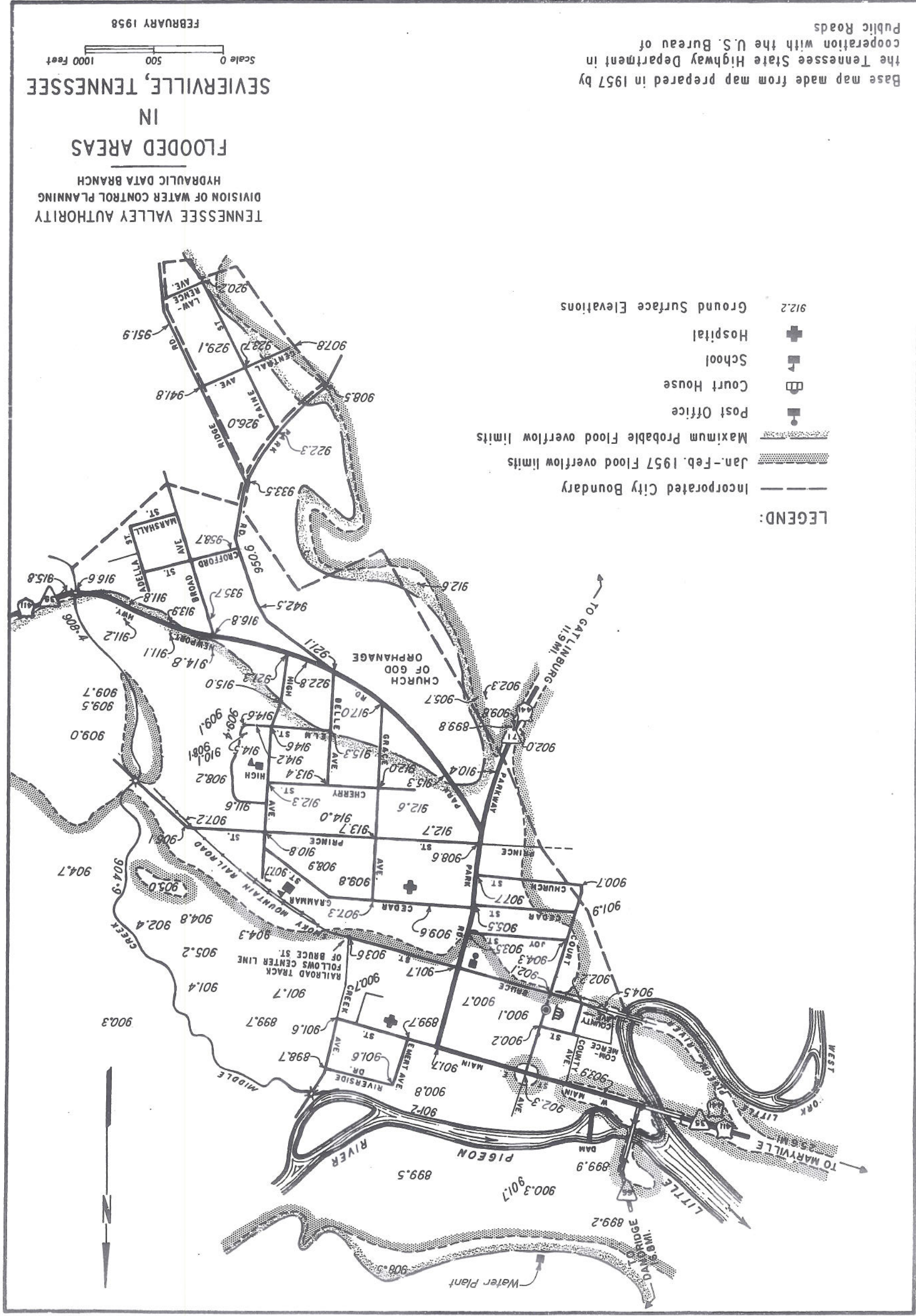
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH

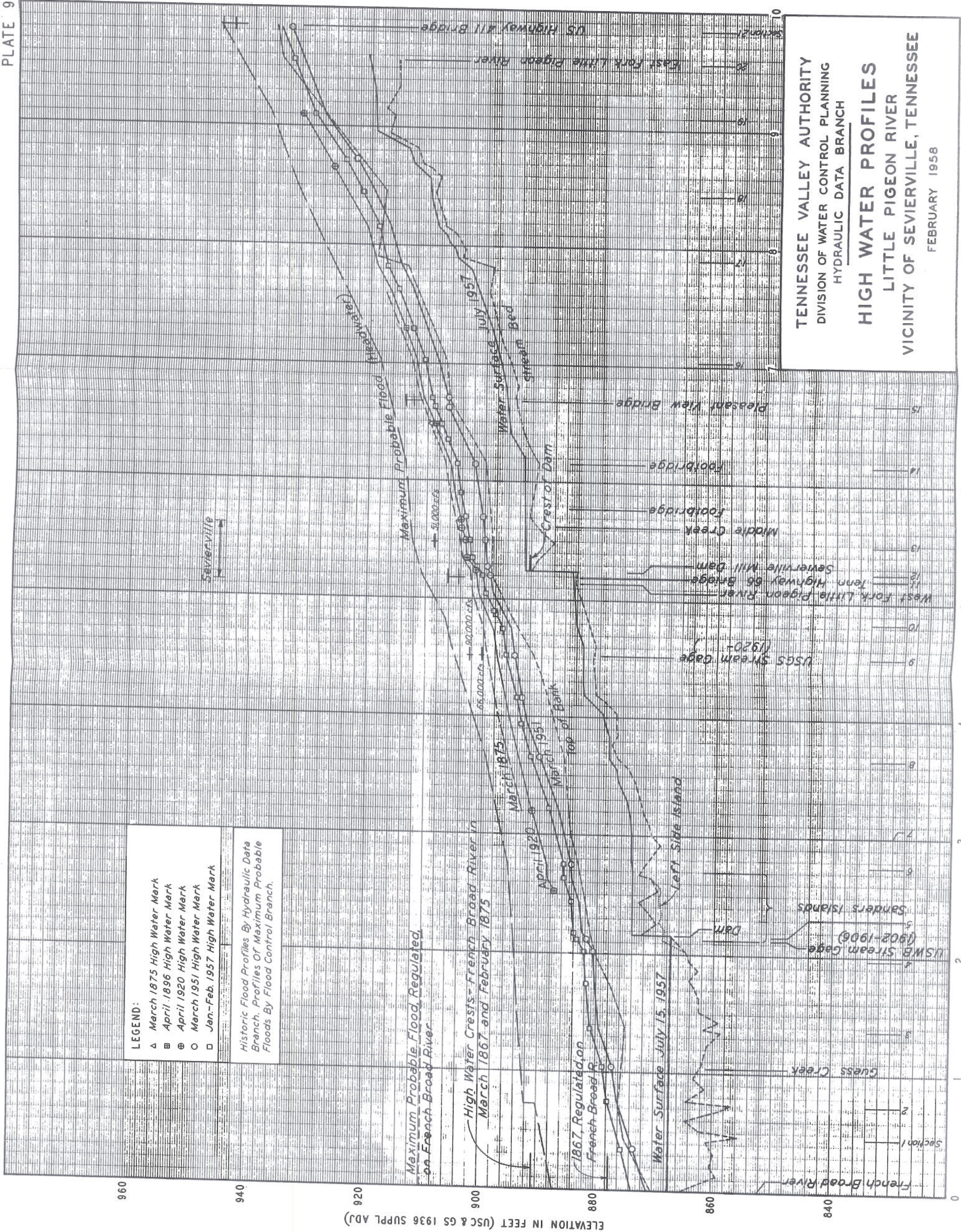
FLOODED AREAS
WEST FORK LITTLE PIGEON RIVER
VICINITY OF SEVIERVILLE, TENNESSEE

Scale 0 1 2 3000 Feet

FEBRUARY 1958

Base map reproduced from a portion
of the 1940 edition of TVA - USGS
topographic map 156 S.E.

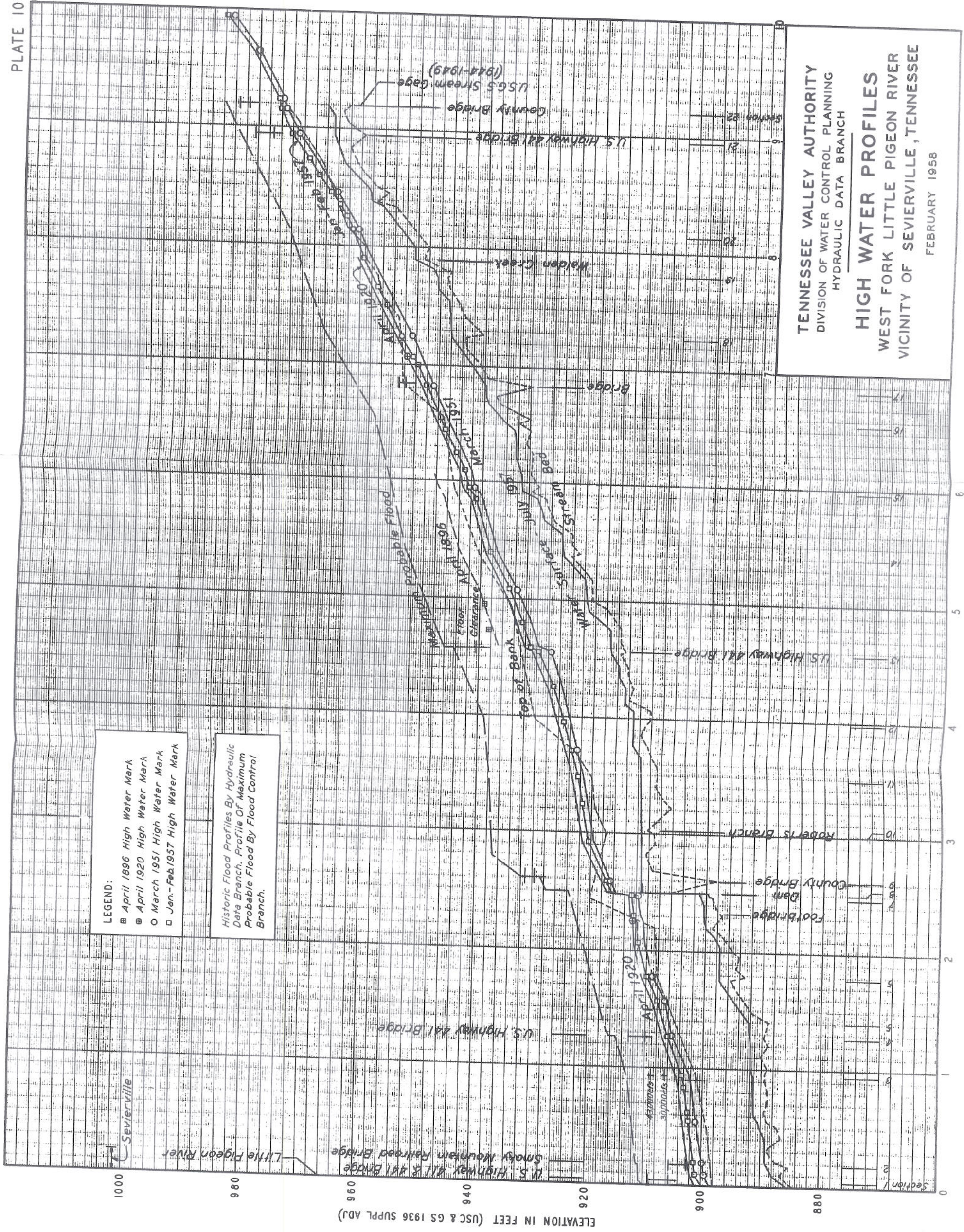




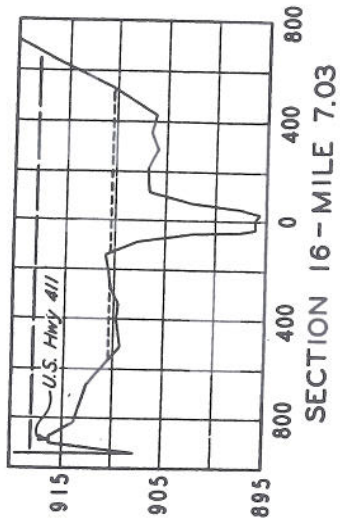
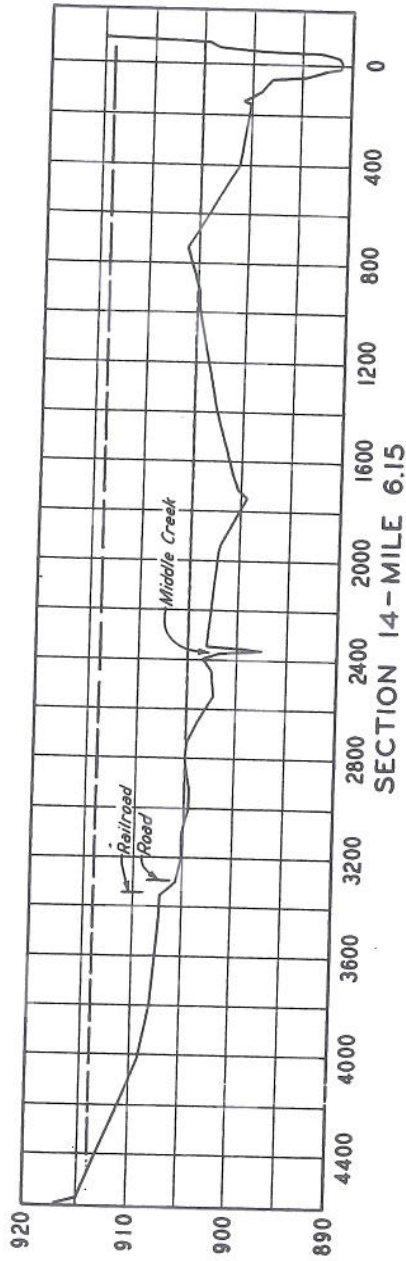
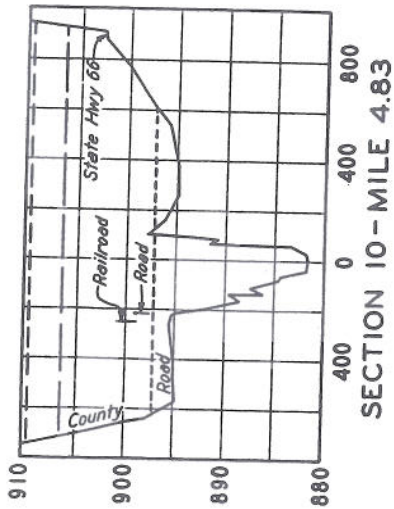
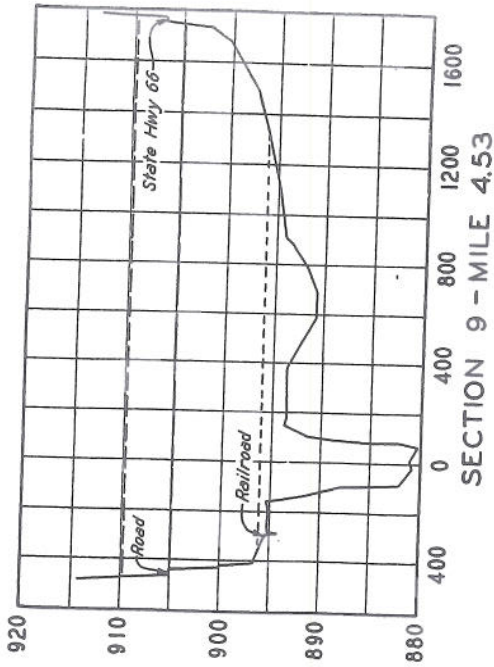
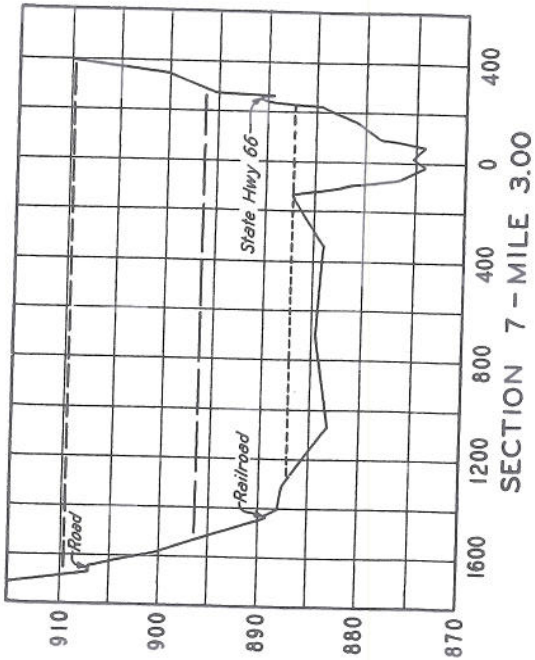
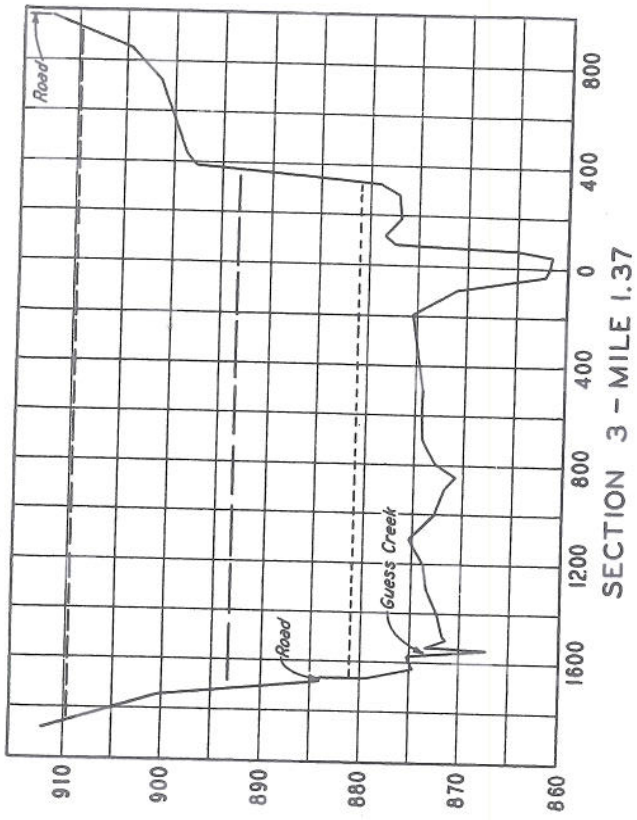
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH

HIGH WATER PROFILES
LITTLE PIGEON RIVER
VICINITY OF SEVIERVILLE, TENNESSEE

FEBRUARY 1958



ELEVATION IN FEET (USC & GS 1936 SUPPL ADJ)



HORIZONTAL DISTANCE IN FEET

Sections taken looking downstream.
Valley cross sections and January 1957
flood elevations by Hydraulic Data Branch.
Elevations of Maximum Probable Floods
determined by Flood Control Branch.
Fourteen cross sections not shown.

LEGEND:

- Backwater From Maximum Probable Flood, Regulated, on French Broad River.
- Maximum Probable Flood (Headwater)
- Jan.-Feb. 1957 High Water

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH

VALLEY CROSS SECTIONS
LITTLE PIGEON RIVER
VICINITY OF SEVIERVILLE, TENNESSEE

FEBRUARY 1958

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING
HYDRAULIC DATA BRANCH
VALLEY CROSS SECTIONS
WEST FORK LITTLE PIGEON RIVER
VICINITY OF SEVIERVILLE, TENNESSEE
FEBRUARY 1956

Sections taken looking downstream.
Valley cross sections and January 1957
flood elevation by Hydraulic Data Branch.
Elevations of Maximum Probable Flood
determined by Flood Control Branch.
Fifteen cross sections not shown.
LEGEND:
Maximum Probable Flood
Jan.-Feb. 1957 High Water

